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61

Taking ESG strategies for achieving profits: a dynamic panel data analysis

Alejandro J. Useche
School of Management, Universidad del Rosario, Bogota, Colombia
Jennifer Martínez-Ferrero
Accounting and Finance Department, Instituto Multidisciplinar de Empresa (IME), Universidad de Salamanca, Salamanca, Spain, and
Giovanni E. Reyes
School of Management, Universidad del Rosario, Bogota, Colombia

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Abstract

Purpose – The goal is to investigate the relationship between financial performance and environmental, social and governance (ESG) indicators and disclosures for a sample of Latin American firms.
Design/methodology/approach – Dynamic panel data regressions are used to analyze a sample of 114 companies listed on the Latin American Integrated Market, MILA (Chile, Colombia, Mexico and Peru) for the period 2011–2020. The Altman *Z*-score and Piotroski F-score are used as indicators of the probability of default and comprehensive financial strength. Models are developed in which the relationship between economic value added (EVA) and Jensen's alpha are evaluated against firms' ESG practices.
Findings – A direct relationship between ESG strategies and financial performance was found. Better practices and transparency in ESG are related to lower probability of bankruptcy, greater financial strength, greater EVA and superior risk-adjusted returns.
Research limitations/implications – ESG data were obtained from the Bloomberg system based on a methodology that may differ from other sources. The sample covers four Latin American countries and large corporations. Independent variables were selected for their perceived validity, given their frequent use in previous studies.
Practical implications – Evidence for company management regarding the importance of strengthening ESG practices and reporting should be part of their balanced scorecards. For investors, the results support the importance of evaluating ESG practices in asset selection.
Originality/value – The present study is the first research to present empirical evidence on the relationship between ESG scores and disclosures for MILA countries, using a comprehensive set of financial performance indicators (Altman *Z*-scores, Piotroski F-scores, EVA and Jensen's alpha).

Keywords ESG, Corporate social responsibility, Financial performance, Dynamic data panel, Developing markets

Paper type Research paper

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1. Introduction

A central tenet of neoclassical financial theory is that a business should maximize value for its shareholders, and any concern for the interests of, and impacts on different groups and communities (stakeholders) is implicit; an investment is worthwhile only as long as it generates positive free cash flows (Bolton, 2015). However, management strategies have evolved in recent decades to include the *environmental, social and governance* (ESG) aspects of a business. This change has also permeated the view of investors, who are increasingly aware of the relevance of including ESG considerations in analyzing the performance of the companies in which they invest (Hyrske *et al.*, 2022; Sherwood and Pollard, 2023).

Although there are debates about the relationship between ESG practices and financial results, most empirical studies have found a direct relationship between them (Derwall *et al.*, 2005; Martínez-Ferrero and Frías-Aceituno, 2015). Although the importance of taking ESG criteria into account in defining a business strategy is conceptually clear, the evidence shows that efforts to include ESG criteria are insufficient, particularly in Latin America (Global Sustainable Investment Alliance, 2021). At the same time, research on the ESG practices of companies in the region and its financial impact is scarce.

Motivated by this backdrop, the central objective of this research is to study the relationship between ESG practices and various financial indicators for companies in Latin America. We focus on member countries of the Latin American Integrated Market (MILA) (Chile, Colombia, Mexico and Peru), the largest transnational stock market integration in this part of the Americas. Thus, the study sample includes 114 companies across various sectors, covering the 10-year period from 2011 to 2020. Using a dynamic panel data analysis, we find a direct relationship between ESG practices and disclosures and financial solvency as measured by Altman's *Z*-score, as well as evidence of superior overall financial strength based on the Piotroski F-score. Additionally, we find that stronger ESG results are related to greater economic value creation and superior stock performance based on risk-adjusted returns.

The remainder of this study is organized as follows: Section 2 presents our theoretical framework and hypotheses. Section 3 explains the methodology, including the data and sample selection process, the empirical measures used and the proposed regression models. Section 4 presents descriptive statistics for the sample and the results obtained from the regression models, along with a discussion of the results. Finally, the conclusions, main findings, contributions and limitations of the study are presented in Section 5.

2. Literature review and hypotheses development

Many studies, both theoretical and empirical, examine the relationship between an organization's ESG performance and its financial results, generating mixed arguments, evidence and conclusions (Wood, 2010). On the one hand, studies such as Levitt (1958) and Friedman (1970) argue that a company's only responsibility is to maximize the wealth of its owners. From this perspective, investing in activities with societal benefits represents a cost that interferes with the goal of optimizing corporate profits. This argument is consistent with an inverse relationship between corporate social investment and financial performance, as proposed by Waddock and Graves (1997), who argue that some managers tend to reduce spending on ESG activities when financial results are adequate to improve reported profits in the short term and, therefore, to receive higher bonuses.

An opposing point of view is presented by theories in the field of corporate social responsibility (CSR), which recognize that businesses have a commitment to the societies in which they operate (Carroll, 1979). In this stream of the literature, Jones (1980) and Freeman (1984) lay the foundations of stakeholder theory, affirming that managers must consider a firm's moral duty to consumers, employees, suppliers, communities and society

in general, including the environment. A growing body of literature presents recent evidence of a positive correlation between ESG ratings and superior financial performance in terms of operating results, risk/return profiles and stock returns (Friede *et al.*, 2015; Valor, 2005; Cherkasova *et al.*, 2023), lowering the cost of capital and boosting a company's brand or overall reputation (Martínez-Ferrero, 2014; Villarón-Peramato *et al.*, 2018; Wei *et al.*, 2018).

However, it is important that companies not only receive acceptable ESG scores from third-party providers but also supply adequate and timely *disclosures* or *sustainability reports*. There are opposing arguments on this issue. On the one hand, the cost of capital perspective (Buallay, 2019) argues that investing in ESG activities increases operational costs and reduces profits, thus reducing market value, at least in the short term (Dalal and Thaker, 2019).

On the other hand, a second approach, known as the value creation perspective, posits that investing in ESG initiatives can help companies to create competitive advantages and strengthen financial performance (Eccles *et al.*, 2014; Goss and Roberts, 2011). From this perspective, more complete disclosures regarding ESG activities and outcomes tend to increase revenue and reduce costs, promoting financial stability and improving strategic decision-making (Eccles *et al.*, 2015; Eccles and Saltzman, 2011). Beyond contributing to better financial performance in the short term, ESG disclosures contribute to value creation in the long term (Jensen, 2000, 2001). Studies such as Fatemi *et al.* (2018) and Li *et al.* (2018) verify that companies with ESG strengths and high levels of disclosure tend to increase their value and vice versa; that is, there is a two-way relationship between these aspects.

Most studies on the relationship between ESG performance and financial results use *return on assets* (ROA) or *Tobin's Q* as dependent variables (Barnett and Salomon, 2012; Buallay, 2019; Van der Laan *et al.*, 2008). Despite their widespread use in the literature, these traditional indicators only partially evaluate an organization's financial performance and risks or its book value relative to its market value.

The field of financial analysis has developed other metrics that provide a more comprehensive view of an organization's financial condition, which is why we define the following as dependent variables in testing our hypotheses: (1) Altman's Z score, a measure of a company's probability of default or bankruptcy (Altman, 1968, 2013; Altman *et al.*, 1977); (2) Piotroski's F score, which expresses the degree of a company's financial strength (Piotroski, 2000); (3) economic value added (EVA), an indicator of the economic profit or wealth created per period (Stern and Shiely, 2001), and (4) Jensen's alpha, a measure of the difference between a stock capital asset pricing model (CAPM) expected return and its realized market return (Mayo, 2011; Sharpe, 1964).

Very few empirical works analyze the relationship between ESG indicators and financial performance in Latin American markets, and their scope in terms of variables studied and time periods is limited. Correa-García and Vásquez-Arango (2020), Duque-Grisales and Aguilera-Caracuel (2021) and Rodríguez-García *et al.* (2022) use ROA or Tobin's Q as dependent variables, studying periods ranging from five to seven years. Garzón-Jiménez and Zorio-Grima (2021) as well as Ramírez *et al.* (2022) focus only on the impact of ESG performance on the cost of capital. Lavin and Montecinos-Pearce (2021) study the relationship between board characteristics and ESG disclosure in the context of a single country. It is therefore important to carry out deeper empirical research in the context of Latin America, a developing region in which academic contributions on environmental sustainability and social welfare can strengthen awareness about corporate responsibility with respect to natural resources, the fight against poverty and corruption (Blowfield, 2005) and societal and government commitments to improving ESG practices that significantly impact the socioeconomic environment (Visser, 2008).

Based on the above discussion, the following two opposite-sign hypotheses are proposed:

H1a. The better a company's ESG performance and reporting, the better its financial performance in the form of a lower probability of bankruptcy, greater financial strength, increased shareholder value and superior risk/return performance.

H1b. The better a company's ESG performance and reporting, the worse its corporate financial performance, expressed as a higher probability of bankruptcy, the weaker its financial strength and ability to generate shareholder value and the worse its risk/return performance.

3. Method

3.1 Data and variables

To create the study sample, we selected the companies from the main stock market indices of the four countries that comprise the MILA (Chile, Colombia, Mexico and Peru) for the period 2011–2020. These indices are as follows: the Índice de Precios Selectivo de Acciones (IPSA) index for Chile (28 companies), the Colombia Investor Relations index (COLIR) for Colombia (23 companies), the Mexican Stock Exchange Price and Quotation Index (MEXBOL) for Mexico (35 companies) and the S&P Lima General Index for Peru (28 companies). The selection criterion for these indices was representativeness, i.e. an index considered the main reference for each country was chosen. The data were obtained from the Bloomberg information system, consisting of an array of 1,150 observations over a 10-year period. The distribution of the sample by country and sector is shown in Table 1.

Dependent variables for this study are (1) Altman Z-score, *z_altman*; (2) Piotroski F-score, *f_piotroski*; (3) EVA, *ln_eva* and (4) Jensen's alpha, *alpha*. To investigate our hypotheses, we propose two explanatory variables, *ESG_score* and *ESG_disc*, referring to ESG performance proxies and disclosure of ESG information, respectively. Data were obtained from the Bloomberg information system. A detailed explanation of Bloomberg ESG performance methodology, including the variables evaluated in the ESG pillars (19 themes and 46 subtopics), is presented in the Online Appendix.

3.2 Research design/model

To test our hypothesis, two basic models are proposed below to explore the relationships between ESG performance (Models 1–4A) and transparency in ESG disclosure (Models 1–4B)

Sector	Chile	Colombia	Mexico	Peru	Total	Percentage %
Communications	1	1	3	0	5	4.4
Consumer discretionary	2	0	3	0	5	4.4
Consumer staples	5	2	8	4	19	16.7
Energy	1	3	0	0	4	3.5
Financials	5	8	7	4	24	21.1
Health care	0	0	1	1	2	1.8
Industrials	1	2	6	2	11	9.6
Materials	3	3	6	13	25	21.9
Real estate	3	0	1	1	5	4.4
Technology	1	0	0	0	1	0.9
Utilities	6	4	0	3	13	11.4

Table 1.
Sample composition by country and sector

Note(s): Sample: 1,150 firm-year observations from 2011–2020
Source(s): Authors' own work

as well as the probability of insolvency (Model 1), measured by the Altman Z-score, and financial strength (Model 2), using the Piotroski F score. In complementary analyses, EVA and Jensen's alpha are used as dependent variables in Models 3 and 4, respectively:

$$\begin{aligned}
\text{Model 1A/B: z_altman} &= \beta_1 \text{ESG_score/ESG_disc}_{it} + \beta_2 \text{Size}_{it} + \beta_3 \text{Leverage}_{it} \\
&\quad + \beta_4 \text{WACC}_{it} + \beta_5 \text{Beta}_{it} + \beta_6 \text{Country}_i + \beta_7 \text{Sector}_i \\
&\quad + \beta_8 \text{Year}_t + \eta_i + \varepsilon_{it} \\
\text{Model 2A/2B: f_piotroski} &= \beta_1 \text{ESG_score/ESG_disc}_{it} + \beta_2 \text{Size}_{it} + \beta_3 \text{Leverage}_{it} \\
&\quad + \beta_4 \text{WACC}_{it} + \beta_5 \text{Beta}_{it} + \beta_6 \text{Country}_i + \beta_7 \text{Sector}_i \\
&\quad + \beta_8 \text{Year}_t + \eta_i + \varepsilon_{it} \\
\text{Model 3A/3B: ln_eva} &= \beta_1 \text{ESG_score/ESG_disc}_{it} + \beta_2 \text{Size}_{it} + \beta_3 \text{Leverage}_{it} \\
&\quad + \beta_4 \text{WACC}_{it} + \beta_5 \text{Beta}_{it} + \beta_6 \text{Country}_i + \beta_7 \text{Sector}_i + \beta_8 \text{Year}_t \\
&\quad + \eta_i + \varepsilon_{it} \\
\text{Model 4A/4B: alpha} &= \beta_1 \text{ESG_score/ESG_disc}_{it} + \beta_2 \text{Size}_{it} + \beta_3 \text{Leverage}_{it} \\
&\quad + \beta_4 \text{WACC}_{it} + \beta_5 \text{Beta}_{it} + \beta_6 \text{Country}_i + \beta_7 \text{Sector}_i \\
&\quad + \beta_8 \text{Year}_t + \eta_i + \varepsilon_{it}
\end{aligned}$$

where i and t represent the company and time period, respectively; η_i is unobservable heterogeneity; ε_{it} is the error term; *Size* represents the size of the company, expressed as the natural logarithm of its assets; *Leverage* is the degree of leverage measured by the ratio of debt to equity; *WACC* is the weighted average cost of capital and *Beta* is the systematic risk of each asset.

3.3 Analytical procedures

Before selecting the appropriate estimator and analysis technique for the proposed regression models, it is necessary to consider the nature of the dependent variable. Initially, either a fixed- or random-effects estimator could be used, but it is necessary to select which one to use. To this end, the Hausman test is used under the null hypothesis of the existence of non-systematic differences between estimators. The result of the Hausman test shows that the p-value does not allow the rejection of H0 at 95% confidence (it is not significant), so we choose random effects.

However, it is also necessary to examine whether the model suffers from the classical econometric problems: heteroscedasticity, autocorrelation and endogeneity. In the specific context of enterprises, their ESG scores and financial results are mutually dependent; that is, better ESG indicators or reports tend to promote better financial results, while organizations with better financial indicators tend to encourage strong ESG practices. This creates the possibility of endogeneity problems, the result of reverse causality between the variables under study (Wooldridge, 2010). In addition, when problems of heteroscedasticity and serial autocorrelation are present, the ordinary least squares (OLS) regression method cannot be used because it does not obtain consistent and efficient coefficients.

In relation to heteroscedasticity, we resort to the modified Wald test under the null hypothesis of homoscedasticity. The test result shows that the null hypothesis at 99% confidence is rejected; there is a problem of heteroscedasticity. Regarding the serial autocorrelation, the Wooldridge test is proposed under the null hypothesis of no-first autocorrelation problems. Its p-value allows to reject the null hypothesis for a 99%

confidence level, supporting the existence of autocorrelation problems. Finally, endogeneity could exist as a result of reverse causality (Wooldridge, 2010) and arises when the proposed research models suffer from self-selection bias. To test the existence of endogeneity, Davidson and MacKinnon (1993) suggest an augmented regression test (Durbin–Wu–Hausman test), which can easily be formed by including the residuals of each endogenous variable, as a function of all exogenous variables, in a regression of the original model. We obtain the residuals of this estimate and subsequently perform an augmented regression where the residuals of the previous model are incorporated as an explanatory variable in our basic model. Since the coefficient obtained in the regression is different from 0, there is an endogeneity problem, and despite the selection of random effects, the OLS estimate is not consistent, and it is necessary to use instrumental variables (IV). IV methods allow for consistent estimation when the explanatory variables (covariates) are correlated with the error terms in a regression model, thus solving the self-selection bias.

Initially, in this step, the possible use of IV will solve the endogeneity problem. However, the conventional IV estimator (although consistent) is inefficient in the presence of the heteroscedasticity and autocorrelation problems previously confirmed by the Wald and Wooldridge tests, respectively. The solution is to employ an IV estimator that guarantees that the three problems are controlled (endogeneity, heteroskedasticity and autocorrelation). To this end, we use the generalized method of moments (GMM) (Arellano and Bond, 1991) and concretely the two-step GMM estimator that produces consistent and unbiased results and eliminates any potential unobserved firm-specific effects by exploiting the dynamic nature of relationship using internal instruments (Roodman, 2009). In this respect, note that although the dependent variable, the irresponsible ESG indicator, is an index coded from 0 to 100 and the Tobit estimator should be employed, the technique should resolve the endogeneity problem that our regression models suffer. To this aim and following the procedure of Hillier *et al.* (2011), we employ the dynamic panel GMM (Arellano and Bond, 1991), which allows us to address the abovementioned problems and obtain consistent and unbiased results (Greene, 2019), using Stata 17 for analysis.

The panel data methodology allows including observations for various companies across multiple time periods, identifying and measuring effects not detectable by other processes and reducing the collinearity between explanatory variables, thereby increasing the efficiency of econometric indicators (Biørn, 2017; Pesaran, 2015). Panel data were used in studies with similar objectives and sample sizes, such as Atan *et al.* (2018), Dalal and Thaker (2019), Fakoya and Malatji (2020) and Landi and Sciarelli (2019).

4. Results

4.1 Descriptive statistics

Table 2 shows descriptive statistics for the dependent and independent variables for the total sample. Altman *Z*-score allows to quantitatively assess a company's probability of bankruptcy: low if $Z > 3.0$, medium when $1.8 \leq Z \leq 3.0$ and high in cases where $Z < 1.8$. Given that the average Altman *Z*-score is 3.13, we conclude that the mean probability of bankruptcy for the companies in the sample is low, although the dispersion of the indicator (5.16) is high.

Regarding the Piotroski *F*-score, a result between 0 and 2 indicates substantial financial weakness, a value between 3 and 5 means the firm is fairly weak, a value between 6 and 7 indicates the firm is relatively strong and a value between 8 and 9 is associated with good financial strength. The average Piotroski F-score of 4.55 with a standard deviation of 1.61 indicates that the financial condition of the MILA companies is relatively weak when average profitability, leverage, liquidity and operational efficiency are evaluated.

Variable	Mean	Std. dev.	Min.	Max.
z_altman	3.1336	5.1602	−1.0111	64.7701
f_piotroski	4.5545	1.6106	0.0000	8.0000
Alpha	2.5161	28.1203	−135.2719	171.6094
ln_eva	8.3150	3.9864	0.1235	16.3543
ESG_score	31.6400	27.2793	0.0000	84.0780
E_score	27.6850	32.1226	0.0000	100.0000
S_score	34.2736	31.6598	0.0000	95.4546
G_score	32.9397	27.6539	0.0000	82.4324
ESG_discl	26.1425	20.8564	0.0000	70.2479
E_discl	21.5505	21.3775	0.0000	84.6572
S_discl	27.8168	23.8473	0.0000	82.4561
G_discl	32.9714	22.8372	0.0000	89.8600
Size	12.7030	3.3701	4.4634	19.5928
Leverage	260.3544	427.6335	2.0776	9650.7030
WACC	8.4405	3.1937	1.2396	24.6047
Beta	0.8124	0.4211	0.0075	2.8907

Note(s): Sample: 1,150 firm-year observations from 2011–2020
Source(s): Authors' own work

Table 2.
Descriptive statistics

A positive Jensen's alpha value, α_i, means that investors earned a higher return than what the CAPM predicted, given the level of risk of the asset or portfolio and overall market conditions. Although the average α_i for the whole sample is positive (2.52), indicating the companies studied delivered excess returns on average, the differences among the individual results are considerable and include both positive and negative values.

As for EVA (the economic profit that was created or destroyed over the period analyzed), the results are also mixed; however, despite significant dispersion across the sample, on average, the companies have a positive EVA, indicating they created value during the period analyzed.

The results in Table 2 show that companies in MILA countries still have a long way to go in terms of CSR activities and results, yielding an average score of 31.64 in terms of overall ESG ratings, which can range from 0 to 100. The average scores were 27.69 in the environmental category, 34.27 for social and 32.94 for corporate governance. Similarly, ESG disclosure is still low in the region, with an average score of 26.14 out of 100, with ratings of 21.55 for environmental, 27.82 for social and 32.97 for corporate governance. These results show that, among the three categories, the environmental category has both the lowest performance and information reporting scores.

Table 3 and Figure 1 show a consistent pattern across the average ESG variables by country for the period studied. In both ESG scores and information reporting, Colombia is in first place, followed by Mexico, Chile and Peru.

	Score				Disclosure			
	ESG	E	S	G	ESG	E	S	G
Chile	31.96	29.80	35.53	30.54	28.90	25.22	31.67	33.48
Colombia	41.36	36.60	46.61	40.77	34.26	27.41	37.67	41.09
Mexico	39.21	34.79	40.34	42.51	31.44	26.39	31.98	41.19
Peru	13.89	9.51	15.39	16.77	10.33	7.32	10.98	15.59

Note(s): Sample: 1,150 firm-year observations from 2011–2020
Source(s): Authors' own work

Table 3.
Average ESG score and disclosure by country, 2011–2020

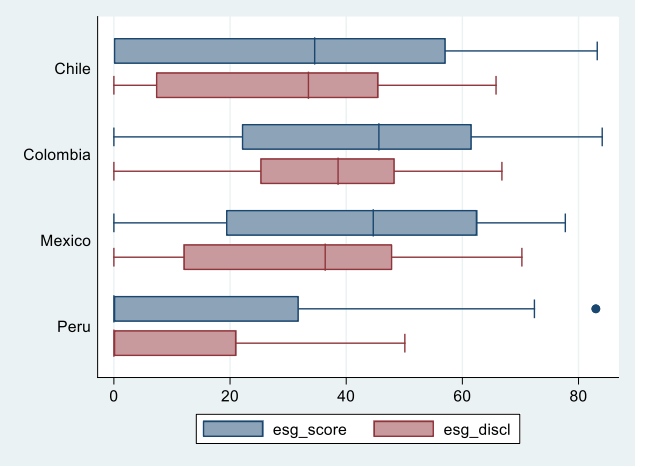


Figure 1.
Average ESG score and disclosure by country, 2011–2020

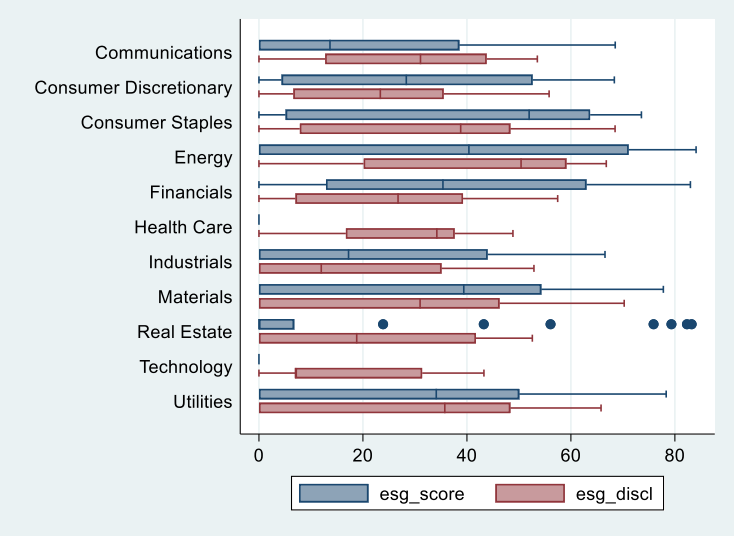
Source(s): Authors' own work

Studying the data by industry, Table 4 and Figure 2 show that the highest average ESG scores are seen in the consumer staples (40.14) and energy (38.29) sectors, while the lowest are in the health care (0.00) and technology (0.00) sectors (on a scale of 0–100). When disaggregating the scores, the two highest outcomes in each category are (1) consumer staples (41.51) and financial services (34.34) for environmental topics; (2) energy (44.02) and consumer staples (42.07) for social and (3) consumer discretionary (40.32) and financial services (40.18) for corporate governance. In each category, the lowest scores were seen in the health care and technology sectors, which had scores of 0.00. In terms of disclosure and reporting of ESG information, Table 4 indicates that the energy and consumer staples sectors have the highest scores (39.81 and 30.76, respectively), while the technology and industrial sectors have the lowest (17.10 and 17.74, respectively). Disaggregating the overall scores, the energy sector has the best disclosure rating in the three ESG categories, while consumer staples is in second place for environmental (28.77), communications is in second place for social (34.04) and health care is in second place for corporate governance (38.79).

	Score				Disclosure			
Industry	ESG	E	S	G	ESG	E	S	G
Communications	21.31	11.67	24.02	28.24	28.58	21.19	34.04	37.95
Consumer discretionary	29.10	19.61	27.35	40.32	22.06	16.12	21.74	32.96
Consumer staples	40.14	41.51	42.07	36.85	30.76	28.77	31.57	34.36
Energy	38.29	34.30	44.02	36.54	39.81	34.30	44.47	47.43
Financials	37.53	34.34	37.98	40.18	24.21	16.96	23.66	34.67
Health care	0.00	0.00	0.00	0.00	28.69	22.53	29.61	38.79
Industrials	22.14	12.98	21.74	31.71	17.74	11.92	18.00	29.52
Materials	31.97	28.02	36.44	31.44	26.45	23.76	28.67	30.13
Real estate	15.02	15.83	17.71	11.53	21.25	15.47	26.22	28.69
Technology	0.00	0.00	0.00	0.00	17.10	8.40	17.67	34.28
Utilities	29.79	23.35	37.83	28.18	27.35	23.99	32.39	29.80

Note(s): Sample: 1,150 firm-year observations from 2011–2020
Source(s): Authors' own work

Table 4.
Average ESG score and disclosure by industry, 2011–2020



Source(s): Authors' own work

Figure 2.
Average ESG score and disclosure by economic sector, 2011–2020

4.2 Results of dynamic panel regression: ESG performance and reporting and financial performance

Table 5 shows the results of the dynamic panel GMM regression in which the dependent variable is the Altman *Z*-score. The first panel shows the results for Model 1A, in which the main independent variable, the ESG score, has a positive and statistically significant coefficient (p-value < 0.01). This result implies that the better the ESG performance of MILA companies, the higher their score on the Altman *Z*-test tends to be and consequently the lower their probability of default. Such a trend is seen in the first panel of Figure 3, using a trend line with a positive slope that relates the ESG score on the horizontal axis with the Altman *Z*-score on the vertical axis.

	Model 1A		Model 1B	
	Coef.	p-value	Coef.	p-value
Main variable				
ESG_score	0.0304***	0.0000		
ESG_disc			0.0656***	0.0000
Control variables				
Size	−0.6796***	0.0000	−0.7352***	0.0000
Leverage	−0.0011***	0.0000	−0.0009***	0.0000
WACC	0.0458	0.1510	0.0224	0.4870
Beta	−0.9272***	0.0000	−0.9025***	0.0000
Wald test	Prob > chi2 = 0.000		Prob > chi2 = 0.000	

Note(s): Controlled by country, industry and year
*, ** and *** represent statistical significance at 10, 5 and 1%, respectively
Sample: 1,150 firm-year observations from 2011–2020
Source(s): Authors' own work

Table 5.
Dynamic panel GMM results for the ESG – Altman *Z*-score relationship

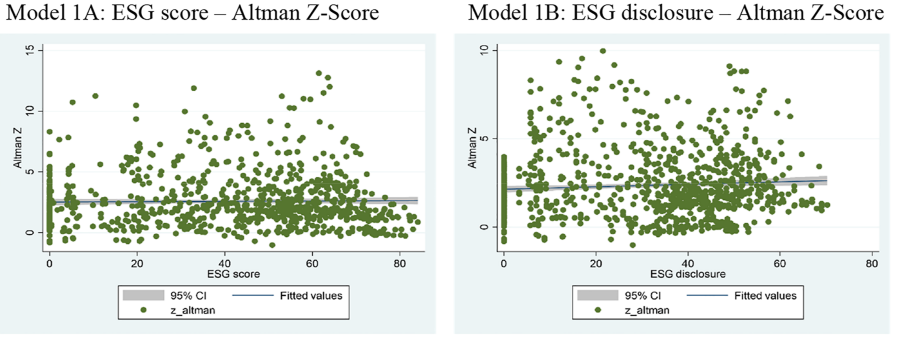


Figure 3.
ESG scores and disclosures – Altman *Z*-score correlation scatterplots

Source(s): Authors' own work

Similarly, the second panel of Table 5 shows that the Model 1B regression coefficient is positive and statistically significant for the degree of disclosure of ESG information. This result highlights the importance of disclosing ESG information, as communicating the results to the public in terms of social responsibility helps the different stakeholders have a better understanding of the way in which the company manages ESG risks and opportunities, contributing to transparency, symmetry of information, consumer trust and brand loyalty (Peterdy, 2023), which is reflected in greater revenue stability and a lower likelihood of bankruptcy. This relationship is also seen in the second panel of Figure 3, in which the correlation diagram shows a trend line with a positive slope.

Model 2 evaluates the relationship between ESG performance and the degree of financial strength measured by the Piotroski F-score, finding a direct relationship between them. The first panel of Table 6 shows that the regression coefficient from Model 2A has a positive sign and is statistically significant. This result implies that better ESG performance tends to generate increased financial strength in MILA companies, expressed in three sets of financial variables: profitability, leverage and liquidity and operational efficiency. Performance of these variables not only indicates the company's current state but also serves as a good predictor of its future trends. The trend line in the first panel of Figure 4 supports this conclusion.

Similarly, Model 2B shows a direct and significant relationship between the degree of disclosure of ESG information and financial strength, indicating that greater transparency in reporting ESG data is related to higher Piotroski F-scores, a finding that reinforces the importance of reporting ESG information to the different stakeholders. The coefficient indicates a positive correlation, as can be seen in the second panel of Figure 4.

The third group of models uses EVA as the dependent variable and finds a positive, statistically significant relationship between EVA and ESG scores and between EVA and the level of ESG information disclosure, as presented in Table 7. These results indicate that the better a company's ESG performance and disclosure are, the more economic profit it generates. Therefore, in the case of MILA, a better performance in terms of CSR tends to increase the return on invested capital and reduce the weighted average cost of capital, resulting in a greater generation of added value per period. This relationship is shown in the correlation diagrams in Figure 5, where positively sloped trend lines are observed in both panels.

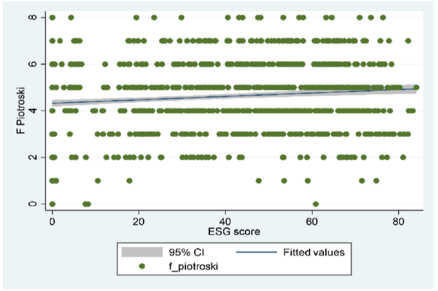
Finally, we evaluated the relationship between ESG aspects and Jensen's alpha, obtaining the results shown in Table 8. Models 4A and 4B show positive and statistically significant coefficients between both the ESG score and the degree of disclosure of ESG information and

	Model 2A		Model 2B	
	Coef.	*p*-value	Coef.	*p*-value
Main variable				
ESG_score	0.0137***	0.0000		
ESG_disc			0.0137***	0.0080
Control variables				
Size	−0.2584***	0.0000	−0.2110***	0.0000
Leverage	−0.0002*	0.0720	−0.0002*	0.0930
WACC	0.0995***	0.0000	0.1001***	0.0000
Beta	−0.2202	0.2080	−0.2334	0.1780
Wald test	Prob > chi2 = 0.000		Prob > chi2 = 0.000	

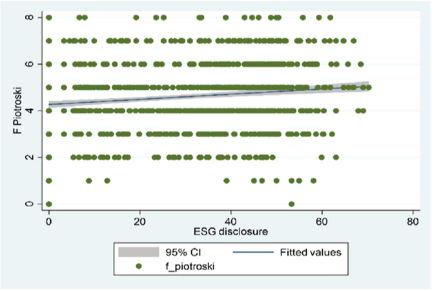
Note(s): Controlled by country, industry and year
*, ** and *** represent statistical significance at 10, 5 and 1%, respectively
Sample: 1,150 firm-year observations from 2011–2020
Source(s): Authors' own work

Table 6.
Dynamic panel GMM results for ESG – Piotroski *F*-score relationship

Model 2A: ESG score – Piotroski F-Score



Model 1B: ESG disclosure – Piotroski F-Score



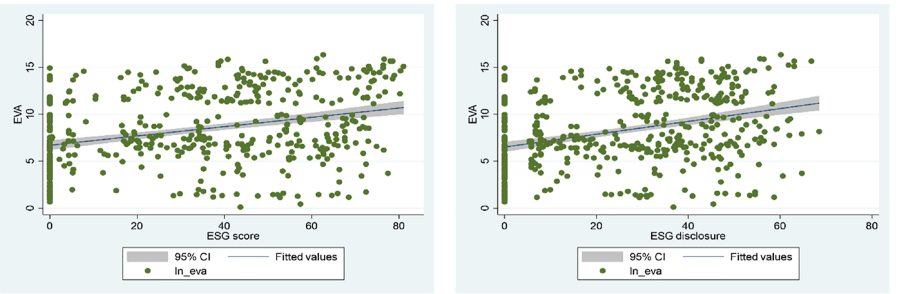
Source(s): Authors' own work

Figure 4.
ESG scores and disclosures – Piotroski *F*-score correlation scatterplots

	Model 3A		Model 3B	
	Coef.	*p*-value	Coef.	*p*-value
Main variable				
ESG_score	0.0108***	0.0010		
ESG_disc			0.0174***	0.0000
Control variables				
Size	0.8954***	0.0000	0.9105***	0.0000
Leverage	−0.0005***	0.0000	−0.0004***	0.0000
WACC	−0.0943***	0.0010	−0.0698**	0.0160
Beta	−1.1598***	0.0000	−1.3766***	0.0000
Wald test	Prob > chi2 = 0.000		Prob > chi2 = 0.000	

Note(s): Controlled by country, industry and year
*, ** and *** represent statistical significance at 10, 5 and 1%, respectively
Sample: 1,150 firm-year observations from 2011–2020
Source(s): Authors' own work

Table 7.
Dynamic panel GMM results for the ESG – EVA relationship



Source(s): Authors' own work

Figure 5.
ESG score and disclosure – EVA correlation scatterplots

	Model 4A		Model 4B	
	Coef.	*p*-value	Coef.	*p*-value
Main variable				
ESG_score	0.1755**	0.0150		
ESG_disc			0.3257***	0.0050
Control variables				
Size	0.1026	0.9410	−1.0867	0.4260
Leverage	0.0012	0.6620	0.0024	0.3960
WACC	1.3333***	0.0100	1.2044**	0.0210
Beta	−15.7456***	0.0000	−14.2188***	0.0000
Wald test	Prob > chi2 = 0.000		Prob > chi2 = 0.000	

Note(s): Controlled by country, industry and year
*, ** and *** represent statistical significance at 10, 5 and 1%, respectively
Sample: 1,150 firm-year observations from 2011–2020
Source(s): Authors' own work

Table 8.
Dynamic panel GMM results for the ESG – Jensen's alpha relationship

Jensen's alpha, indicating that better ESG results and more transparency in ESG reporting are positively related to excess returns for a company's stock compared to expected returns predicted by the CAPM. In this sense, the results allow us to identify the presence of a premium ESG, which means that investors in the MILA tend to receive a higher return than theoretically expected when they include in their portfolios shares of companies with superior ESG performance, which is evidence of the advantages of using responsible investment criteria for the selection of assets in this Latin American stock market. The positive relationships between ESG performance and ESG reporting and Jensen's alpha are shown in the two panels in Figure 6.

5. Discussion

5.1 Theoretical implications

This research contributes to the debate on the relevance of CSR and its relationship to business results while filling gaps in the literature, as it studies this issue in the Latin American context and expands the indicators of financial analysis to provide a more comprehensive view. This study is the first to present empirical evidence on the relationship between ESG scores and disclosures for Latin American companies, specifically for the member countries of MILA, using a comprehensive set of financial

performance indicators. In particular, while previous studies use basic indicators such as ROA and Tobin's Q as dependent variables, this study conducts an evaluation of companies' financial performance by calculating Altman *Z*-scores, Piotroski F-scores, EVA and Jensen's alpha.

The results obtained from the regression models using dynamic panel data support Hypothesis 1a, which means that higher ESG scores and better ESG reporting are related to better financial performance, expressed as a lower probability of bankruptcy (higher Altman *Z*-scores), greater financial strength (higher Piotroski F-scores), more economic profit generated (positive EVA) and superior returns for a given level of risk (higher Jensen's alpha). The coefficients produced by the regressions show that better ESG scores and reports tend to be positively related to better liquidity, reserves, profits, market values and operating income – components of Altman's *Z*-score – as well as better profitability, leverage and operational efficiency ratio aspects, which are evaluated by the Piotroski F-score.

Our findings show the importance of strong ESG practices and disclosures, consistent with the conclusions in Lindgreen *et al.* (2009) and Maignan and Ferrell (2001), are particularly relevant for Latin America, a region in which ESG scores and the level of ESG disclosures in particular still have much room for improvement.

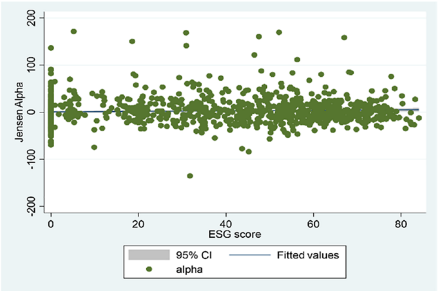
In general, the coefficients found in the basic models (Models 1 and 2) support the importance of obtaining good ESG scores, as those scores correlate directly with financial performance. The basic models also highlight the importance of transparency in reporting ESG information. The ESG scores for the Latin American companies in our sample (Tables 2 and 3) lead us to conclude that this region has a long way to go to achieve satisfactory ESG practices, with a particular weakness in ESG disclosures.

Model 3 reinforces the importance of good ESG practices, since both ESG scores and the degree of disclosure are positively related to creating EVA, one of a company's main financial objectives. An organization with strong ESG performance tends to increase its return on operational assets, reduce its cost of capital and create economic value.

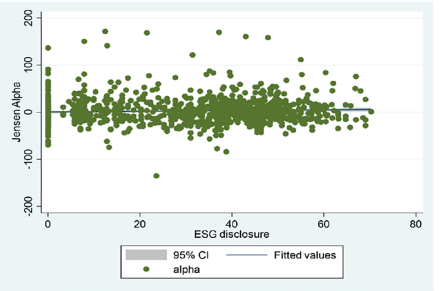
Finally, Model 4 shows a positive relationship between ESG scores and disclosures and Jensen's alpha, indicating that allocating capital to socially responsible companies can be an attractive choice for investors as shares of companies with good ESG practices tend to generate higher levels of return than expected given their sensitivity to systematic risk.

This study supports the argument that better ESG indicators tend to be associated with greater financial strength, consistent with findings in Croft and Malhotra (2016), Friede *et al.* (2015) and Valor (2005).

Model 3A: ESG score – Jensen's Alpha



Model 3B: ESG disclosure – Jensen's Alpha



Source(s): Authors' own work

Figure 6.
ESG score and disclosure – Jensen's alpha correlation scatterplots

5.2 Managerial/policy implications

The managerial and policy implications of these findings are varied. At the country level, MILA members must advance in their ESG performance and in the disclosure of this information, which requires greater commitment from their managers to generate positive contributions to society and the environment. The strengthening of regulatory frameworks that incentivize ESG results through a clear structure of incentives and penalties is essential to this end, as well as pressure from financial markets and civil society.

In sectoral terms, the findings of this research can be translated into a call to the different industries to strengthen their performance and their ESG information reporting, mainly to the health care, technology, real estate, communications and industrial sectors.

In relation to company management, this research presents useful evidence regarding the importance of strengthening ESG policies, practices and reporting systems, which should be part of the balanced scorecards of firms. This would encourage firms to monitor their progress, generate better ESG reports that include quantitative indicators and develop corporate strategies to achieve better ESG performance, which is positively related to financial results. Results support the relevance of designing programs to improve the financial indicators proposed in this research (Altman and Piotroski scores, EVA), in addition to better-known accounting or market indicators (such as ROA, ROE and Tobin's Q), which would help them create value, strengthen the firm's financial position and reduce the probability of default. Such an approach can promote EVA for shareholders and contribute to the company's long-term sustainability.

On the other hand, the GMM methodology, used to correct classical econometric problems, made it possible to verify a lagged causal relationship. This means that ESG performance in a given period has an effect on financial results in subsequent periods. An important practical implication, then, is that the economic benefits of ESG investing do not necessarily occur immediately, so they should be regarded by firms as a long-term investment.

For investors, the results support the importance of evaluating ESG practices in asset selection to complement traditional methods of technical and fundamental analysis, as the stocks of companies with outstanding ESG performance and better ESG reporting tend to show superior risk-adjusted returns. At the same time, including ESG criteria allows investors to meet their personal goals by allocating capital to socially and environmentally responsible companies. Given the low ESG scores that are still seen in Latin America, there is a clear need to promote an ESG-aware business culture; public policy could generate incentives to support this in a way that complements private initiatives.

This study also contributes to empirical arguments that support using ESG indicators as complementary tools for assessing investment opportunities, i.e. the "responsible investment" approach, in line with the conclusions in Madhavan *et al.* (2021) and Ooi and Lajbcygier (2013). We find that better ESG practices tend to be accompanied by superior performance in the stock market. Thus, investors will prefer to construct portfolios with stocks of firms that have strong ESG practices, as our results show such companies may deliver actual returns that exceed the expected return according to the CAPM.

5.3 Limitations and future research agenda

Despite the abovementioned contributions, this research has certain limitations. The first is the nature of the ESG data, which were obtained from the Bloomberg system that uses a methodology that may differ from those used by other sources of ESG information. Second, the sample covers four Latin American countries that, although considered representative, are not enough to reach exhaustive conclusions regarding the entire region. Third, only companies that are sufficiently large enough to be listed on the stock exchange were included in the sample. Fourth, regarding the definition of regression models, independent variables were selected for their perceived validity, given their frequent use in previous studies. Fifth, while the Piotroski

F-score is regularly applied to all industries, the Altman *Z*-score may have greater relevance for nonfinancial companies. Sixth, a characteristic of the study is that the stock market index of each market (IPSA, COLIR, MEXBOL and S&P Lima) was selected following a criterion of representativeness, i.e. an index considered a general reference for each country was taken, with another alternative being the use of criteria of securitization, capitalization or social responsibility. Future research could include more countries and companies from elsewhere in Latin America as well as other developing regions, and the results could be disaggregated by economic sector. It would also be interesting to include other independent variables and analyze their mediating effects. Including data from small and medium-sized companies would shed light on the broad nature of ESG phenomena, their interrelationships and impacts, although ESG information on such companies is currently very limited and difficult to obtain.

6. Conclusions

The dynamic panel data analysis in this research, applied to 114 companies listed on MILA exchanges (Chile, Colombia, Mexico and Peru) for the period 2011–2020, allowed us to verify a direct relationship between ESG practices and a company's financial strength. The results obtained corroborate our hypothesis regarding how better ESG scores and transparency are related to a lower probability of bankruptcy, greater overall financial strength, greater economic value created and superior risk-adjusted performance. The evidence found allows us to conclude that, in general, Latin American companies (mainly in health care, technology, real estate, communications and industrial sectors) still have a long way to go in terms of ESG performance and disclosure, which will allow them to improve their financial results and increase their contributions to society over time.

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Supplementary material

The supplementary material for this article can be found online.

Corresponding author

Alejandro J. Useche can be contacted at: alejandro.useche@urosario.edu.co