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# Corporate Sustainability Reporting Compliance Factors: A Panel Data Study of Listed Companies in Peru

*Factores de cumplimiento de reportes de  
sostenibilidad corporativa: un estudio  
de datos de panel de empresas cotizadas  
en Perú*

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## Abstract

*In 2016, the Peruvian Stock Market Superintendency (SMV, by its Spanish acronym) mandated listed companies to publish a Corporate Sustainability Report in the Peruvian stock market as part of corporate governance policies. This research aims to analyze the evolution of compliance levels with the requirements for the sustainability reports established by the SMV as well as the corporate determinants for listed companies in Peru. This quantitative and explanatory research was conducted using a panel data linear regression analysis with fixed effects for the period 2018–2022, to assess the determinant effect of the independent variables on levels of corporate sustainability reporting compliance. The results show an unsteady increase in the level of sustainability reporting compliance until 2022, mainly in social performance. For the regression model with fixed effects on the year variable, the following are determinants of the level of sustainability reporting compliance: company size, belonging to sectors with higher sustainability impact, and voluntary sustainability reporting.*

**Keywords:** determinants of sustainability reporting, corporate governance, listed companies, Peru, sustainability report.

**JEL Classification:** M14, M48, Q56.

## Resumen

*Desde el año 2016, la Superintendencia del Mercado de Valores del Perú (SMV) ha establecido la obligatoriedad para las empresas cotizadas de publicar el reporte de sostenibilidad corporativa en el mercado de valores peruano como parte de las políticas de gobierno corporativo. Esta investigación tiene como objetivo analizar la evolución del nivel de cumplimiento de los requerimientos para la elaboración de los reportes de sostenibilidad exigidos por la SMV y analizar los determinantes corporativos para las empresas cotizadas en Perú. Este estudio, cuantitativo y explicativo, se realizó mediante un análisis de regresión lineal de datos de panel con efectos fijos para el periodo 2018–2022, con el fin de evaluar el efecto determinante de las variables independientes sobre el nivel de cumplimiento de los reportes de sostenibilidad corporativa. Los resultados muestran un aumento no sostenido en el nivel de cumplimiento de los informes de sostenibilidad hasta 2022, principalmente en el desempeño social. Para el modelo de regresión con efectos fijos sobre la variable año, los determinantes del nivel de cumplimiento de reporte de sostenibilidad son los siguientes: el tamaño de la empresa, la pertenencia a sectores con mayor impacto en la sostenibilidad y la elaboración voluntaria de reportes de sostenibilidad.*

**Palabras clave:** determinantes de reporte de sostenibilidad, gobierno corporativo, empresas cotizadas, Perú, reportes de sostenibilidad.

**Clasificación JEL:** M14, M48, Q56.

## 1. Introduction

In 2016, the Peruvian Stock Market Superintendency (SMV, by its Spanish acronym), the regulatory body for companies listed on the Lima Stock Exchange (BVL, by its Spanish acronym), mandated the publication of a Corporate Sustainability Report as part of the non-financial information requirements for environmental and social performance and compliance with sustainability standards. Other countries also have such a reporting requirement set by regulatory bodies, given the importance of transparency for stakeholders. Furthermore, much academic research has been done on levels of transparency and the quality of sustainability disclosure in the stock markets (Christensen et al., 2021; Gerwing et al., 2022; Venturelli et al., 2017). Research on mandatory sustainability reporting indicates that its purpose is to provide more objective, comparable, and verifiable information, enabling stock market users to make more efficient decisions, as pointed out by studies in stock market-regulated countries (Gulenko, 2018; Matuszak & Rozanska, 2017; Roy et al., 2022).

The literature considers institutional theory as explaining the motivations for sustainability reporting influenced by public and private regulatory bodies, where, as a result of coercive and normative isomorphisms, companies seek to emulate other companies in terms of disclosure (Powell & DiMaggio, 1991; Scott, 1987; Zucker, 1987). Mandatory non-financial reporting has led to a rise in the publication of separate or integrated sustainability reports that, based on an institutional influence, follow regulatory compliance models, and seek to respond to the economic, social, or environmental interests of stakeholders, as shown in the studies of Agostini et al. (2022), Carungu et al. (2021), Posadas & Tarquinio (2021), and Venturelli et al. (2017).

However, other research, such as that conducted by Costa & Agostini (2016), Larrinaga et al. (2002), and Luque-Vílchez & Larrinaga (2016), argues that mandatory reporting has not improved the quality and relevance of sustainability information. Rather, it has resulted only in a regulatory and compliance reform, not in organizational and sustainability management change or in engagement with stakeholders. Furthermore, while sustainability reporting should consider both financial and sustainability materiality, there is a risk that the reporting is limited to investors, with less accountability to other stakeholders (Carrasco et al., 2022; Macias & Ficco, 2022).

In Latin America, the adoption of voluntary corporate sustainability reporting and practices has developed significantly in recent years. However, research findings

show that reporting levels have not reached international compliance standards due to a lack of sustainability strategies in companies, an incipient institutional normative, as well as the coercive influence of stock market regulatory bodies that have not made adequate information available to assess sustainability risks and opportunities in stakeholder decisions (Aranguren & Maldonado, 2019; Hernández-Pajares, 2023; Moneva et al., 2019, Sepúlveda-Alzate et al., 2022).

In Peru, sustainability reporting studies are still in development, and have mainly focused on voluntary sustainability reporting in accordance with the Global Reporting Initiative (GRI) standards (Aubert & Venegas, 2022; Bunclark & Barcellos-Paula, 2021; Díaz-Becerra et al., 2021; Pocomucha & Venegas, 2021). Moreover, mandatory non-financial sustainability reporting studies have focused on analyzing reporting factors. It is thus considered important to continue this line of research regarding the evolution of sustainability transparency by listed and regulated companies in Peru (Hernández-Pajares & Pocomucha, 2021; Caballero et al., 2019).

The objective of this research is therefore to analyze the evolution of compliance with the requirements of the sustainability report established by the SMV and corporate determinants for the period 2018-2022 for listed companies in Peru.

## 2. Theoretical Background

### 2.1 Institutional Influence

Regulation of sustainability information in public markets by regulatory and governmental bodies, such as the European Union (EU), has had a significant institutional influence on companies' levels of transparency. However, although the amount of information provided has increased, it has not reached the levels of quality voluntary information established by, for example, the GRI standards (Agostini et al., 2022; Caputo et al., 2020; Carungu et al., 2021; Ottenstein et al., 2022).

The first type of institutional influence on sustainability reporting is normative. In keeping with this, companies improve their voluntary sustainability reporting based on normative compliance, similar to other companies, in accordance with international standards, and compete to achieve stakeholder legitimacy and influence (Carini et al., 2018; Christensen et al., 2021; Masoud & Vij, 2021). This has been impacted locally by professional associations and internationally, by, for example, the GRI standards (Fortanier et al., 2011; Neu et al., 1998).

Furthermore, mandatory sustainability reporting has had a coercive institutional influence, as companies comply with specific reporting requirements due to pressure from regulatory bodies to improve accountability, essentially in response to investment risk assessment decisions by stock market investors. Nevertheless, improvements in sustainability strategies and practices by companies for better transparency are still required (Carungu et al., 2021; De Villiers & Alexander, 2014; Gulenko, 2018; Jackson et al., 2019; Posadas & Tarquinio, 2021).

## 2.2 Reporting Factors

In addition to institutional influences on the mandatory sustainability reporting of regulated companies, studies have also addressed other corporate factors, such as levels of resource investment, performance, and relevance of the influence of previous disclosure experiences, as determinants of such reporting (Bergmann & Posch, 2018; Costa & Agostini, 2016). In this sense, studies, such as those conducted by Aragón-Correa et al. (2020) and Balluchi et al. (2021), have found that regulatory pressures, in conjunction with voluntary pressures, positively influence improvement and innovation in sustainability strategies and performance in environmental aspects rather than these merely being a response to prevent sanctions.

Besides corporate aspects of company size and profitability, other research has found additional influencing factors, such as stock index rating, belonging to business sectors with a higher sustainability impact, and voluntary reporting experience, as seen in the studies of Mion & Loza (2019); Gerwing et al. (2022); Radu et al. (2023), Venturelli et al. (2017) and Wang et al. (2018).

Regarding company size, the greater the resources and capacity available for sustainability management, the more likely companies will implement sustainability aspects and reporting to improve their legitimacy and reputation with stakeholders. Larger companies seek to enhance their global reputation and consider mandatory sustainability reporting as an opportunity to boost the confidence of their investors and reduce information asymmetry and agency costs, as well as to improve their reputation in the market (Bergmann & Posch, 2018; Gerwing et al., 2022; Mio et al., 2020; Mion & Loza, 2019; Roy et al., 2022).

Research on the relationship between economic performance and levels of sustainability disclosure within a context of mandatory regulation is not conclusive. In some cases, a positive and significant relationship between profitability and levels

of mandatory sustainability reporting as a form of legitimacy for stakeholders have been found (Abdul Rahman & Alsayegh, 2021; Hernández-Pajares & Pocomucha, 2021). However, in other cases, a negative relationship is found, that is, transparency is not due to better performance but to the search for reputation (Mion & Loza, 2019; Masoud & Vij, 2021). Finally, no significant relationship has also been found between performance and reporting levels, that is, better-performing companies do not necessarily seek sustainability transparency to ensure financing through stock market investors (Balluchi et al., 2021; Gerwing et al., 2022; Mio et al., 2020).

Studies on companies that implement activities with a high environmental and social impact show that these companies report more sustainability information to legitimize their activities with stakeholders affected by activities such as manufacturing, power generation, mining, and other natural resource consumption activities. Such companies seek to legitimize their operations, resulting in this factor being more representative than institutional influence (Aranguren & Maldonado, 2019; Balluchi et al., 2021; Caputo et al., 2020; Mio et al., 2020).

Studies of mandatory regulation, such as those conducted by Balluchi et al. (2021), Doni et al. (2020), Matuszak & Rozanska (2017), and Schröder (2022), indicate that previous experience of sustainability management and voluntary sustainability reporting, in most cases under GRI standards, results in a better level of mandatory reporting compliance and an increased capacity to adapt and prepare quality mandatory sustainability information. In addition, membership of companies in certain stock indexes, such as the S&P and sustainable indexes, is a determinant of the level of mandatory sustainability reporting (Loza-Adaui, 2020; Ioannou & Serafeim, 2017).

Based on the previous theoretical background, we propose the following hypotheses:

H1. Company size is a positive and significant factor in levels of corporate sustainability reporting compliance.

H2. Company profitability is a positive and significant factor in levels of corporate sustainability reporting compliance.

H3. Belonging to sectors with a higher sustainability impact is a positive and significant factor in levels of corporate sustainability reporting compliance.

H4. Voluntary sustainability reporting is a positive and significant factor in levels of corporate sustainability reporting compliance.

H5. Membership in the S&P index in the BVL is a positive and significant factor in levels of corporate sustainability reporting compliance.

### 3. Methodology

Our research employed a quantitative approach of explanatory scope. The ordinary least squares (OLS) panel data regression estimation method was implemented, using a cluster at the company level for the period 2018-2022, to assess the determinant effect of the corporate variables of size, profitability, business activity with sustainability impact, voluntary sustainability reporting, and S&P membership on level of corporate sustainability reporting compliance. The year-fixed effect model regression analysis was also employed. The factor analysis in this study used STATA 17 software. A qualitative content analysis approach was also used on the compliance of disclosed aspects of sustainability performance by the companies regarding the new requirements for the report established in 2020.

Company size was considered the first independent variable for the explanatory study, measured by the natural logarithm of the value of assets for the periods prior to the reporting period (Braam et al., 2016; Gerwing et al., 2022). The variable of profitability was measured by the value of return on assets (ROA) for the 2017-2021 periods prior to the reporting period (Aboagye-Otchere et al., 2020; Braam et al., 2016; Mio et al., 2020). Type of activity reflected the BVL sectors: financial, industrial, mining, energy, services, and trade. These were classified into a categorical variable of two groups, one including the sectors with significant sustainability impact, such as industry, mining, and energy, with a value of 1, and a second that included sectors without significant sustainability impact, such as services, finance and trade, with a value of 0 (Caputo et al., 2020; Mio et al., 2020). The variable of voluntary reporting was calculated using a dichotomous variable with a value of 1 if voluntary reporting was done (GRI or non-GRI) for the study periods and 0 if voluntary reporting was not done (Balluchi et al., 2021; Schröder, 2022). Membership in the S&P in the BVL was valued using a dichotomous variable with a value of 1 if the company was listed in the S&P categories for the study periods and 0 if it was not listed (Loza-Adauí, 2020).

The dependent variable is the sustainability reporting compliance level for 2019-2021. First, a categorical variable was measured, with a value of 0 if the requirement of sustainability reporting indicators was not reported and 1 if it was reported. The dependent variable was determined for the regression analysis by the average influence rate of total required indicators for each company (Braam et al., 2016; Carini et al., 2018; Jackson et al., 2019).

To better understand the variable of reporting compliance level, it is necessary to explain the content of the SMV-issued regulations, whose requirements are classified into environmental performance, suppliers, other stakeholders, labor performance, human rights, and standards. The main difference with the new 2020 report is compliance with environmental performance, labor performance, human rights, and voluntary reporting. Table 1 shows the requirements for the reports issued in 2020 and in 2016 and their equivalencies for each category (see Table 1).

**Table 1.** Comparison of Requirements for 2020 and 2016 Reports

Performance	2020 Report	2016 Report
Environmental	<b>Environmental management system or environmental policy</b>	<b>Environmental impact-related corporate policy</b>
	<b>Details of investigation, imposition of corrective measures, affecting environmental standards</b>	
	<ul style="list-style-type: none"> <li>Greenhouse gas (GHG) emission measurement</li> </ul>	
	<ul style="list-style-type: none"> <li>GHG emissions reduction targets</li> </ul>	<ul style="list-style-type: none"> <li>Quantification of GHG emissions</li> </ul>
	<ul style="list-style-type: none"> <li>Water consumption measurement</li> </ul>	<ul style="list-style-type: none"> <li>Quantification and documentation of total water consumed</li> </ul>
	<ul style="list-style-type: none"> <li>Water footprint measurement</li> </ul>	
	<ul style="list-style-type: none"> <li>Water consumption reduction targets</li> </ul>	
	<ul style="list-style-type: none"> <li>Effluent control mechanisms</li> </ul>	
	<ul style="list-style-type: none"> <li>Energy consumption measurement</li> </ul>	<ul style="list-style-type: none"> <li>Quantification and documentation of total energy use</li> </ul>
	<ul style="list-style-type: none"> <li>Energy consumption reduction targets</li> </ul>	
	<ul style="list-style-type: none"> <li>Solid waste measurement</li> </ul>	<ul style="list-style-type: none"> <li>Quantification and documentation of waste generated</li> </ul>
	<ul style="list-style-type: none"> <li>Waste management targets and goals</li> </ul>	

Performance	2020 Report	2016 Report
Suppliers	<ul style="list-style-type: none"><li>Inclusion of social, environmental, and corporate governance aspects in supplier selection criteria</li></ul>	<ul style="list-style-type: none"><li>Updated supplier registry</li><li>Criteria for selecting suppliers and complying with labor legislation</li><li>Policy for selecting suppliers that comply with environmental standards</li><li>Policy for managing the relationship with suppliers</li></ul>
Other stakeholders	<ul style="list-style-type: none"><li>Identification of risks and opportunities related to stakeholders</li><li>Details of any significant controversy with any stakeholders</li></ul>	<ul style="list-style-type: none"><li>Work in collaboration with the community</li><li>Investment in social programs where the main activities are carried out</li><li>Community interaction policies</li><li>Specify the social conflicts in the community where it operates</li><li>Customer management policy</li><li>Customer complaint registry</li><li>Permanent public service channels or means</li><li>Recognition of quality in the service provided to customers</li></ul>

Performance	2020 Report	2016 Report
Labor	<ul style="list-style-type: none"> <li>Details of labor policy</li> </ul>	<ul style="list-style-type: none"> <li>Labor policy and fundamental employee rights</li> </ul>
	<ul style="list-style-type: none"> <li>Details of investigation, imposition of corrective measures or fines related to non-compliance with labor, health and safety, or child labor regulations</li> </ul>	
	<ul style="list-style-type: none"> <li>Evaluation of compliance with occupational health and safety regulations</li> </ul>	
	<ul style="list-style-type: none"> <li>Accidents at work registry</li> </ul>	<ul style="list-style-type: none"> <li>Occupational accident registry</li> </ul>
	<ul style="list-style-type: none"> <li>Measuring your work environment</li> </ul>	<ul style="list-style-type: none"> <li>Work environment evaluation</li> </ul>
	<ul style="list-style-type: none"> <li>Worker talent management policy</li> </ul>	<ul style="list-style-type: none"> <li>Worker training plan</li> </ul>
	<ul style="list-style-type: none"> <li>Procedures for detecting and sanctioning workplace hostility and sexual harassment</li> </ul>	
Human rights	<ul style="list-style-type: none"> <li>Compliant or grievance handling policy or system to reduce the impact on human rights</li> </ul>	
	<ul style="list-style-type: none"> <li>Training plan on human rights topics</li> </ul>	
Standards and reporting	<ul style="list-style-type: none"> <li>International corporate sustainability-related certification</li> </ul>	<ul style="list-style-type: none"> <li>Sustainability standards</li> </ul>
	<ul style="list-style-type: none"> <li>Corporate Sustainability Report other than mandatory report</li> </ul>	

Source: Prepared by the authors, based on SMV (2016) and SMV (2020).

Based on the above variables, a multiple linear panel data regression model was designed considering a fixed effect per year. For the companies, the correlation of observations for the five consecutive years was monitored using a cluster at the company level observed five times. Thus, the standard errors are robust and do not show significant changes. The regression model was as follows:

*Reporting rate*<sub>*i,t*</sub>

$$\begin{aligned}
 &= \beta_0 + \beta_1 \text{Size}_{i,t-1} + \beta_2 \text{ROA}_{i,t-1} + \beta_3 \text{Type of industry}_{i,t} \\
 &\quad + \beta_4 \text{Voluntary reporting}_{i,t} + \beta_5 \text{S\&P}_{i,t} + \varepsilon_{i,t}
 \end{aligned}$$

Where:  $i = \text{company}$ ,  $t = \text{year (2022, 2021, 2020, 2019, 2018)}$ ,  $t-1 = \text{year prior to } t (2021, 2020, 2019, 2018)$ .

The Hausman test was performed to determine whether the panel data regression model fits a year-fixed effect. The results showed that the coefficients of the independent variables remain constant for each individual company in the panel data and do not vary with time and the observed units. The individual heterogeneity of each case in the model was monitored by applying the fixed effects model in panel data regressions for the analysis of sustainability disclosure factors, such as in the study by Wang (2017).

The sample calculation was based on a total population of 260 companies listed on the BVL in 2022. This population was adjusted by excluding investment fund companies, securitization process management companies, and companies that did not publish sustainability reports, leaving a total of 220 companies. From the adjusted population, stratified random sampling by sector was carried out with a confidence level of 95% and a margin of error of 5%, resulting in a sample of 116 companies, as detailed in Table 2. It can be seen that the most representative companies belong to the financial, industrial, and energy sectors (see Table 2).

**Table 2.** Sample of companies by sector

Business sector	Frequency	Percentage
Pension management companies	3	2 %
Agro-industrial	9	8 %
Banks and finance companies	26	22 %
Trade	4	4 %
Energy and oil	13	12 %
Industrial	18	16 %
Real estate/Construction	9	7 %
Mining	11	10 %
Insurance	12	10 %
Services	11	9 %
Total	116	100 %

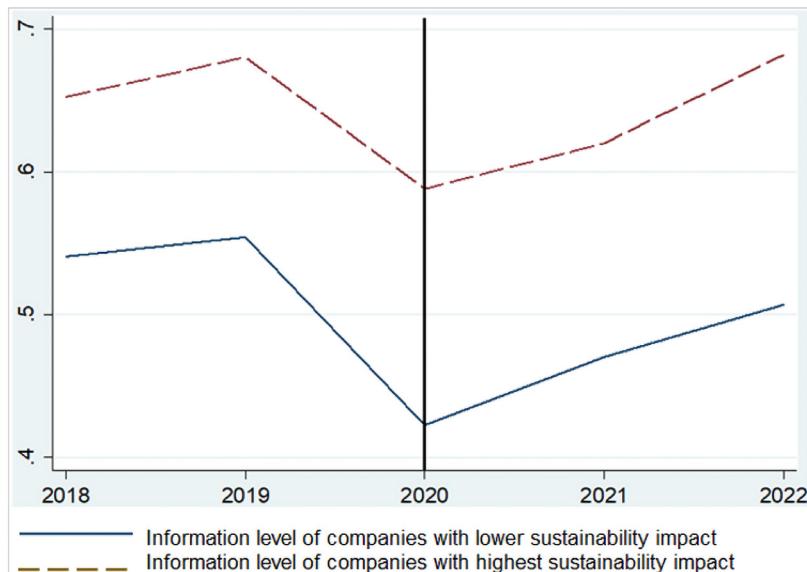
Source: Prepared by the authors.

## 4. Results

### 4.1 Descriptive Analysis

Figure 1 shows that the mean of compliance with sustainability reporting requirements does not show a steady increase (see Figure 1). The compliance level rose from 2018 to 2019, decreased for 2020, and increased again for 2021 and 2022. This represents an improvement in reporting levels, with the first report in 2019 and a second in 2022, with the new report comprising more reporting requirements for each environmental, labor, and human rights category. It is worth noting that reporting compliance was higher for companies with significant sustainability impact, such as mining, energy, and industrial companies, compared to trade, finance, and service companies, with a marked increase in 2022 compared to 2021.

**Figure 1.** Annual Evolution of the Mean of Sustainability Reporting Compliance

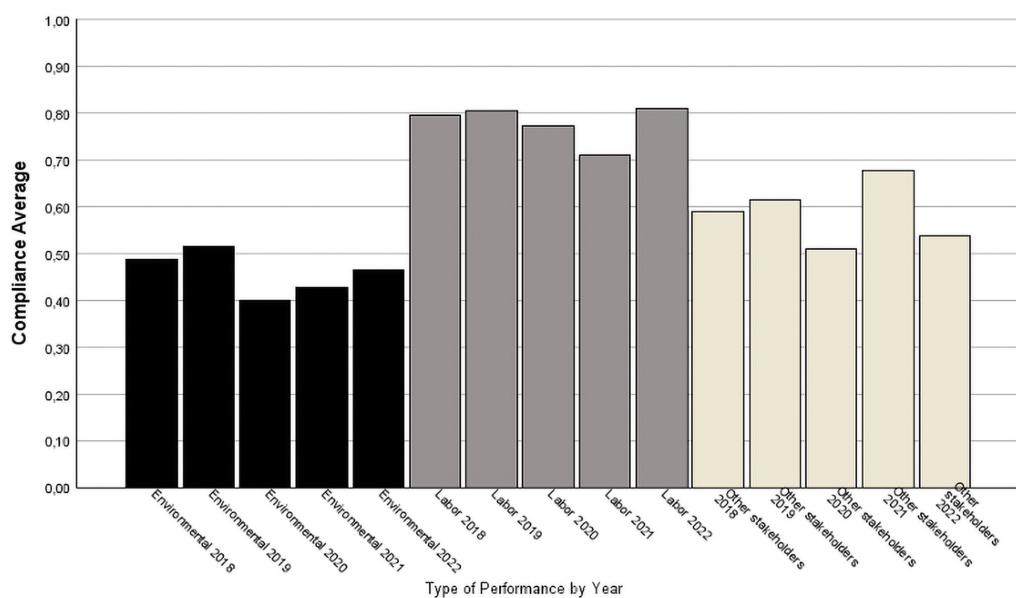


Source: Prepared by the authors.

The analysis of the evolution of reporting compliance by environmental, labor, and other stakeholder categories, shown in Figure 2, did not find a sustained increase during

the period under study (see Figure 2). The means of compliance with environmental practices were lower than for labor performance and other stakeholders, such as suppliers, customers, and the community. Although the environmental performance reporting requirements did not show the highest compliance, it is worth highlighting that energy, water, and waste savings management, as well as carbon or water footprint measurements were the least disclosed.

**Figure 2.** Means of Reporting Compliance by Sustainability Performance Categories

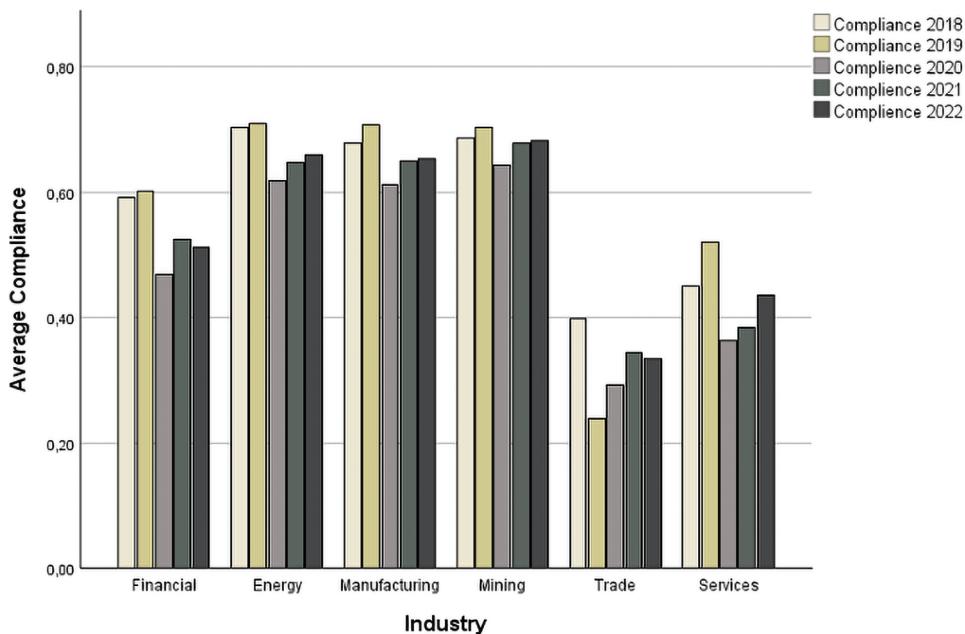


Source: Prepared by the authors.

Social reporting on performance and workers in occupational health and safety, and labor climate management aspects had the highest levels of compliance. Reporting on management and other stakeholders, such as suppliers, in environmental and labor compliance evaluations are particularly noted due to regulatory influence and because they are direct stakeholders in the operational management of companies (Carini et al., 2018; Gulenko, 2018). Labor performance is fundamental as a sustainable practice in almost all types of activities, as pointed out in the studies of Aranguren & Maldonado (2019), Christensen et al. (2021), and Korca et al. (2021).

Figure 3 shows levels of compliance with sustainability reporting requirements by business activity (see Figure 3). Regarding environmental performance, we note that the sectors with the highest level of compliance are energy, industry, and mining, corresponding to companies with a higher environmental and social impact that are also strongly oriented to sustainability performance and sustainability reporting on environmental practices by their productive activity, as pointed out in the studies of Balluchi et al. (2021), Carini et al. (2018), and Caputo et al. (2020).

**Figure 3.** Means of Sustainability Category Reporting Compliance by Business Activity



Source: Prepared by the authors.

The significant reporting compliance for companies with high sustainability impact is mainly due to the labor performance of their large number of workers. However, the financial sector also has a significant level of reporting on performance with workers (Korca et al., 2021; Schröder, 2022). For sustainability reporting of performance with other stakeholders, sustainable value chain management with suppliers in productive activities should be highlighted, especially management

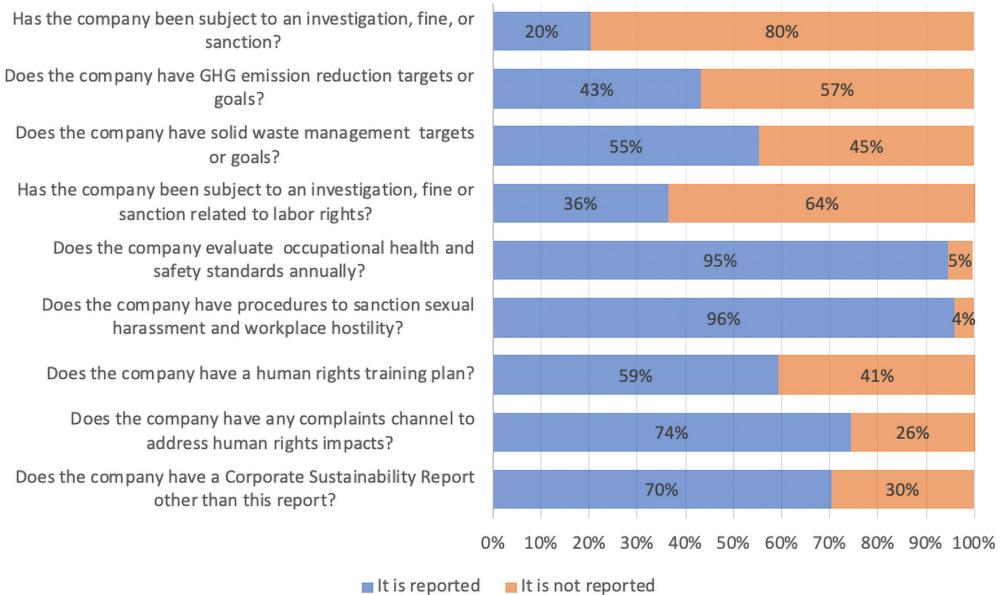
with communities for mining, industrial, and energy companies, for which the social impact and search for legitimacy is significant, as found in studies conducted by Ivic et al. (2021), Loza-Adaui (2020) and Pocomucha & Venegas (2021).

To better analyze the evolution of sustainability reporting during the period under study, we analyzed the information content that resulted from the changes required by the new 2020 report. Figure 4 shows the mean of compliance with the new reporting requirements for the period 2021, grouped by key axes of the new sustainability report (see Figure 4). The means for compliance with environmental performance reporting are the lowest. It was found that most companies have not defined greenhouse gas (GHG) reduction or solid waste management targets or goals.

There are also companies that only report a series of initiatives they have adopted to contribute to the care of the environment, such as energy savings, recycling of non-hazardous materials, efficient use of resources, and awareness of their employees on the responsible use of resources. It is important to mention that while some companies claim to have implemented management control systems, they do not report indicators related to environmental management, specifically GHG reduction and solid waste management. Commitments are reported, but there are no specific goals for or measurements of environmental matters. In addition, it is noted that companies report targets with little mention of measurable and relevant compliance practices that should be disclosed in more detail in the reports.

Regarding social and labor performance disclosure, almost all companies report performing annual evaluations of compliance with occupational health and safety policies, which can be evidenced by reported legal compliance. Additionally, companies report to have implemented procedures to identify and sanction sexual harassment and workplace hostility. This is also due to regulatory compliance rather than to objectives of labor management with employees.

As shown in Figure 4, human rights and labor rights performance are the most significant. Ninety-six percent of the companies report procedures to sanction harassment and hostility at work, 59% report that they have a human rights training plan, and 74% report that they have a channel for complaints regarding human rights violations. On the other hand, 95% of the companies disclose annual evaluations of safety and health occupational standards. Finally, 70 % of the companies report that they prepare voluntary sustainability reports, with some indicating that these are prepared in accordance with the GRI (see Figure 4).

**Figure 4.** Compliance with New Mandatory Sustainability Reporting Requirements for the Period 2021

Source: Prepared by the authors with data from the report content analysis.

## 4.2 Regression Analysis

Table 3 shows the descriptive statistics of the variables for the 116 companies studied and for each year of the regression model (see Table 3). The analysis of the variables reveals different patterns for the reporting level, ROA, and asset size. The degree of reporting compliance shows some variability over the years, with means that do not reflect full compliance. The reporting level has changed due to the need for companies to adapt to each report by learning and implementing sustainability and communication objectives. Furthermore, ROA shows a notable fluctuation over time. For example, 2020 has extremely negative values, possibly reflecting significant financial problems experienced by certain companies during the COVID-19 pandemic (Rosales et al., 2021). In contrast, the company size, as measured by the logarithm of the volume of assets, appears to remain relatively stable over the years, with consistent means and modest standard deviations, indicating stability in the size of company assets during the period considered.

**Table 3.** Regression Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Standard deviation
Reporting level 2018	116	0	1	0.5985502	0.2739751
Reporting level 2019	116	0	1	0.6195468	0.2652678
Reporting level 2020	116	0	1	0.5082615	0.2606557
Reporting level 2021	116	0	1	0.5477730	0.2727706
Reporting level 2022	108	0	1	0.5977832	0.2360786
ROA 2018	116	-0.268779	0.697357	0.0553307	0.1031582
ROA 2019	116	-0.418815	0.287353	0.0366210	0.0856114
ROA 2020	116	-50.30010	0.225695	-0.6375204	5.2045650
ROA 2021	116	-2.202250	0.331103	0.0188849	0.2576616
ROA 2022	116	-2.202250	0.331103	0.0188849	0.2576616
Asset size 2018	116	8.357024	18.75715	13.827200	1.7732600
Asset size 2019	116	8.567316	18.82615	13.864760	1.7699830
Asset size 2020	116	8.228711	19.11383	13.858440	1.9093500
Asset size 2021	116	8.254008	19.06253	13.916900	1.9409000
Asset size 2022	116	8.780941	19.00847	13.94586	1.9402960

Source: Prepared by the authors with data obtained from information in financial reports using STATA 17 software.

Table 4 shows the correlation analysis used to evaluate whether the independent variables of the model showed multicollinearity problems (see Table 4). The test results showed correlation coefficients that exceeded the 0.5 threshold, suggesting a low linear association between the variables.

**Table 4.** Correlation of Regression Variables

	ROA	Size	S&P	Sector type	Reporting level	Year
ROA	1.0000					
Size	0.1652	1.0000				
S&P	0.0239	0.2540	1.0000			
Sector type	-0.0084	-0.1144	0.2864	1.0000		
Reporting level	0.0607	0.4652	0.3432	0.1770	1.0000	
Year	-0.0055	0.0220	-0.0000	0.0000	0.0000	1.0000

Source: Prepared by the authors with data obtained from STATA 17 software.

Table 5 shows the regression results of the panel data regressions under two models (see Table 5). The first column presents the OLS model without fixed effects. It can be observed that the asset size has a significant and positive effect with a coefficient of 0.0243, meaning that larger companies tend to have a higher sustainability reporting rate. The first hypothesis is thus accepted with a significance level of less than 0.001.

However, ROA has a negative and significant coefficient of -0.0061, meaning that unprofitable companies have a higher reporting level than better-performing companies. The second hypothesis of a positive relationship between profitability and reporting rate was therefore rejected.

As observed in the descriptive analysis, the variable of the business sector with higher sustainability impact has a significant and positive influence with a coefficient of 0.0920 on the reporting level. The third hypothesis was thus accepted with a positive significance level of less than 0.001, meaning that companies with higher environmental and social impact have greater disclosure.

**Table 5.** Multiple Linear Regression Panel with Fixed Effects

	(1) Reporting rate (MCO)	(2) Reporting rate (Fixed effects)
Log (Asset size)	0.0243*** (4.36)	0.0129* (1.04)
ROA	-0.00608*** (-6.00)	-0.00107** (-0.49)
Sustainability impact sector (1=belongs)	0.0920*** (4.93)	0.1490*** (4.95)
Voluntary reporting (1=Reports)	0.243*** (11.93)	0.0798* (11.36)
S&P(1=membership)	0.0998*** (4.79)	0.0244 (3.78)
Year	-0.0106 (-1.85)	-0.0161*** (-5.18)
Constant	21.51 (1.86)	32.87*** (5.26)
<i>N</i>	572	572
<i>R</i> <sup>2</sup>	0.444	0.536

*t* statistics in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Source: Prepared by the authors with data from the content analysis of sustainability and financial reports using STATA 17 software.

Likewise, voluntary reporting by companies was a positive and significant factor of the sustainability reporting rate. The fourth hypothesis is accepted with a significance level of less than 0.001, meaning that the companies with voluntary sustainability reporting, such as the GRI, exhibited higher mandatory reporting compliance. Similarly, the variable of membership in the S&P index has a significant and positive impact. The fifth hypothesis is thus accepted with a significance level of less than 0.001, meaning that companies with membership in the S&P index have a higher level of sustainability reporting.

The second column presents the regression model with fixed effects. The results differ slightly but confirm those obtained in the OLS model. The fixed effect model was more representative as it considered the heterogeneity of the companies.

Company size continued to show a positive and significant effect, with a lower coefficient of 0.0129. As a result, acceptance of the first hypothesis, that larger companies had higher disclosure, is maintained, with a significance of less than 0.05. As the coefficient for ROA continues to be negative and less significant at -0.0011, the second hypothesis is still rejected.

The sustainability impact of the sector maintained a significant, positive coefficient greater than 0.1490, so the third hypothesis is accepted with a significance level of less than 0.001. In addition, voluntary reporting also maintained a positive and significant effect on the level of disclosure with a coefficient of 0.0798. The fourth hypothesis is thus still accepted with a significance level of 0.05. The variable of S&P is the only variable that was no longer statistically significant in the fixed effect model, inhibiting acceptance of the fifth hypothesis.

## 5. Discussion of Results

The results of this research found an unsteady increase in levels of sustainability reporting compliance for Peruvian listed companies as demonstrated in the descriptive statistics in Table 2. As shown in Figure 2, the greatest disclosure of information on sustainability corresponded to social performance, mainly related to benefits with workers, with an average compliance of 70% to 80%, and management with other stakeholders, with an average compliance of 50% to 70%, related to operating activities. However, information on environmental practices had lower levels of disclosure, with an average of only 40% to 50%, focused mainly on water and energy saving management and waste management. This indicates that greater resources and knowledge are required for the implementation of environmental strategies and goals for better environmental information levels that do not only correspond to compliance with reporting requirements (Balluchi et al., 2021; Caputo et al., 2020; Posadas & Tarquinio, 2021).

Thus, for the new 2020 sustainability reporting requirements, it was found that companies have better implemented and disclosed their policies and procedures related to labor and human rights (Carini et al., 2018; Gulenko, 2018). However, as shown in Figure 2, the lowest levels of compliance corresponded to environmental requirements for companies still in the learning phase in terms of environmental performance and information. Companies with greater environmental impact and information did not report environmental objectives or management in sufficient

detail in the sustainability report (Aranguren & Maldonado, 2019; Sepúlveda-Alzate et al., 2022). A minimal approach to reporting compliance requirements was found, based on coercive isomorphism resulting from institutional influence on mandatory reporting. Greater proactivity in sustainability performance is required to ensure better transparency (Aragon-Correa et al., 2020; Bergman & Posch, 2018; Radu et al., 2023).

Considering the above, not only did institutional influence impact levels of disclosure, but type of industry was also a determinant of sustainability reporting compliance. Companies with high environmental and social impact activities, such as mining, energy, and manufacturing, justified a higher level of disclosure to legitimize their activities with the information required by mandatory reporting with stakeholders (Aranguren & Maldonado, 2019; Bergman & Posch, 2018; Fortanier et al., 2011; Mion & Loza, 2019; Sepúlveda-Alzate et al., 2022).

Company size was a determinant of sustainability reporting compliance for the companies studied. According to the agency theory, large companies, with better share prices and corporate governance policies, are expected to have better sustainability performance and information as a way of legitimizing the financial decisions of investors (Christensen et al., 2021; Gerwing et al., 2022; Mio et al., 2020; Roy et al., 2022). The profitability effect in this study was negative on the reporting level. This result can be explained by the fact that highly profitable companies consider mandatory sustainability reporting as a regulatory compliance due to coercive institutional influence rather than as a way to obtain financing in the stock market (Hernández-Pajares & Pocomucha, 2021; Loza-Adaui, 2020), or because less profitable companies seek legitimacy in the eyes of their stakeholders with more sustainability information (Masoud & Vij, 2021; Mio et al., 2020).

Finally, previous experience in voluntary sustainability management and sustainability reporting following the GRI standards or others as a determinant of the level of mandatory sustainability reporting was confirmed. The listed companies with more experience in environmental and social management and voluntary reporting have a better level and quality of mandatory sustainability reporting (Bergman & Posch, 2018; Doni et al., 2020; Mion & Loza, 2019; Schröder, 2022).

## 6. Conclusions

This study analyzed the evolution of compliance with mandatory sustainability reporting requirements and corporate determinants for listed companies in Peru.

The results did not show full compliance with sustainability reporting requirements during the period studied. This information impacts the declaration of environmental and social commitments. It shows low levels of disclosure of sustainability strategies and management due to a lack of experience or institutional influence. Compliance tends to be limited to minimum reporting requirements (Loza-Adaui, 2020; Mion & Loza, 2019; Venturelli et al., 2017).

Although improvements are evident with the new report in terms of labor and human rights information, sustainability reports present little detail on strategic sustainability management. This may be due to the lack of requirements for this reporting that include a compliance focus and description of practices. Sustainability reporting may not be a major driver of change at organizations in sustainability performance in the period studied. This confirms mainly an institutional influence based on coercive isomorphism for compliance with reporting requirements (Carini et al., 2018; Posadas & Tarquinio, 2021).

The low levels of sustainability information provided by the companies suggest that Peruvian companies may have less incentive to provide sustainability information for users who need to make financial investment decisions and evaluate risks, as pointed out in the studies conducted by Roy et al. (2022) and Wang & Li (2016). It is considered that there is a need for greater institutional influence of the regulatory bodies in the Peruvian stock market to develop reporting regulations in line with international standards, such as the GRI, and integrated reports under ESG (Environmental, Social, Governance) criteria that include long-term strategic corporate sustainability objectives and that do not result in simple regulatory reporting standards. The participation of regulatory bodies and business and professional associations should exert greater influence on the regulation of corporate sustainability disclosure, both to shareholders and other stakeholders, as suggested by Costa & Agostini (2016) and Larrinaga et al. (2002).

The implications of this study suggest the need for future qualitative content analysis research to assess not only compliance with requirements, but also the quality of sustainability information in separate or integrated sustainability reports based on international standards and ESG criteria, as well as to analyze the influence of sustainability reporting on financial performance and value of companies in the stock market.



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