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**Influence of ownership structure on sustainability reports and levels of informational disclosure of integrated reporting in B3 companies**

*Influência da estrutura de propriedade nos relatórios de sustentabilidade e nos níveis de evidenciação informacional do relato integrado nas empresas da B3*

*Influencia de la estructura de propiedad en los informes de sostenibilidad y niveles de divulgación de información de informes integrados en empresas B3*

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**KEYWORDS**

Property Structure.  
Integrated Reporting.  
Sustainability report.

**Abstract:** This research aimed to verify how the ownership structure influences the dissemination of sustainability reports and the levels of informational disclosure of the integrated report in B3 companies. For that, a sample of 299 companies was used in the years 2017 and 2018. The data were analyzed using binary logit regression and multiple regression with panel data. The results showed that the number of members on the board of directors, as well as the number of independent members of that board, positively influenced the disclosure of sustainability reports. However, the concentration of shares and the presence of women on the boards proved to have no influence on sustainability-related disclosures. These results contribute to the discussion of the effects of the characteristics of the ownership structures on the adoption and disclosure of corporate sustainability reports, and may help companies, investors and regulators about the potential effects of the composition of the boards of directors of companies in the concern with transparency and the dissemination of sustainability actions.

**PALAVRAS-CHAVE**  
Estrutura de Propriedade.  
Relato Integrado.  
Relatório de  
Sustentabilidade.

**Resumo:** Esta pesquisa teve como objetivo verificar como a estrutura de propriedade influencia na divulgação de relatórios de sustentabilidade e nos níveis de evidenciação informacional do relato integrado nas empresas da B3. Para tanto, utilizou-se uma amostra de 299 empresas nos anos de 2017 e 2018. Os dados foram analisados por meio de regressão logit binária e regressão múltipla com dados em painel. Os resultados demonstraram que a quantidade de membros no conselho de administração, bem como o número de membros independentes desse conselho influenciou de maneira positiva a divulgação dos relatórios de sustentabilidade. No entanto, a concentração de ações e a presença de mulheres nos conselhos demonstraram não ter influência nas divulgações relativas à sustentabilidade. Esses resultados cooperam para a discussão dos efeitos das características das estruturas de propriedade sobre a adoção e evidenciação de relatórios de sustentabilidade empresarial, podendo auxiliar às empresas, investidores e reguladores sobre os potenciais efeitos da composição dos conselhos de administração das empresas na preocupação com a transparência e a divulgação de ações de sustentabilidade.

**PALABRAS CLAVE**  
Estructura de la  
propiedad. Informes  
Integrados. Reporte de  
Sostenibilidad.

**Resumen:** Esta investigación tuvo como objetivo verificar cómo la estructura de propiedad influye en la difusión de los informes de sostenibilidad y los niveles de divulgación de información del informe integrado en las empresas B3. Para ello se utilizó una muestra de 299 empresas en los años 2017 y 2018. Los datos se analizaron mediante regresión logit binaria y regresión múltiple con datos de panel. Los resultados mostraron que el número de miembros de la junta directiva, así como el número de miembros independientes de esa junta, influyeron positivamente en la divulgación de los informes de sostenibilidad. Sin embargo, la concentración de acciones y la presencia de mujeres en los directorios demostraron no tener influencia en las revelaciones relacionadas con la sustentabilidad. Estos resultados contribuyen a la discusión de los efectos de las características de las estructuras de propiedad en la adopción y divulgación de los informes de sostenibilidad empresarial, y pueden ayudar a las empresas, inversionistas y reguladores sobre los efectos potenciales de la composición de los directorios de las empresas en la preocupación por la transparencia y la difusión de las acciones de sostenibilidad.

## Introduction

As a result of both industrial and technological advances and globalization, society has experienced changes in lifestyle. In many cases, such changes may bring social inequality and environmental degradation, which have caused worries in different aspects, chiefly in the business realm. In this perspective, the disclosure of financial and economic only reports has not been enough to fulfill users' vast information needs (Di Domenico, Mazzioni, Kronbauer & Simionatto, 2016; Pinheiro, Soares e Abreu, 2020).

Whilst economists such as Friedman (2009) and Mankiw (2009) have stated that the main purpose of a company is the profit maximization for stakeholders, others, such as Ashley (2005) and Davis (1975), have argued that the purpose of businesses should be more comprehensive. The latter authors claim that profit is not an essential factor, since the disclosure of reports is necessary because of their informative content as they display how companies create value, obtain good performance and how they share results with society.

Beyond the aforementioned information needs and the diverse requirements to be met, companies also have a strong Corporate Social Responsibility (CSR) concerning human, social and environmental values owing to their fundamental character in the social and economic growth and development (Castro, Siqueira & Macedo, 2010). This way, CSR and the growing demand for more complete information opened the path for the making of Sustainability Reports (SR), having the Integrated Report (IR) as one of them, as it is usually done in many companies (IIRC, 2013).

Unlike other sustainability reports, the IR is a non mandatory corporate report that aims to reconcile and converge information generated by management systems and corporate communication to display creation of value in short, medium and long terms, as well as putting together financial and non financial information about strategy, management, performance and future perspective in a way in which the company's social, environmental and business context are reflected (Deloitte, 2019; Kassai, Carvalho & Kassai, 2019).

As for the disclosure of sustainability reports, Ullmann (1985) proposes a tridimensional model, structured onto three pillars: the concerned parties'

power, strategic posture and corporate performance. Those pillars encompass how a company's ownership structure is defined, given that such matters are part of the scope of action of corporate regulatory bodies, including the directive and executive boards.

Ownership Structure (OS) refers to the way a company's ownership, management and shareholding structure are divided (Jensen & Meckling, 1976). According to Ghazali (2007), OS is a determining tool in the informational disclosure about corporate sustainability. This (OS) has been the object of study of various research papers; however, the results are still divergent. Consolandi, Nascenzi and Jaiswal-Dale (2008), Haniffa e Cooke (2005) e Naseem, Rehman, Ikram e Malik (2017) found association between the way OS is established and the acknowledgement of information on sustainability. Nonetheless, Fauzi, Mahoney and Rahman (2007) and Prado-Lorenzo, Gallego-Alvarez and Garcia-Sanchez (2009) have not noticed such association.

Domenico et al.'s research (2016) analyzed the relation between socio-environmental responsibility and the ownership structure of companies listed on B3 in 2013 and 2014. The results suggested that the average of environmental indicators of companies with less capital concentration is higher in relation to the companies with larger capital accumulation and that there is no relation between CSR and ownership structure. It must be taken into consideration, though, that this research focused on environmental investments and it did not investigate other determining CSR factors that can be influenced by ownership structure.

Pinheiro et al.'s (2020) study checked how ownership structure influences Corporate Social Responsibility when it comes to employee centered practices in companies listed on the CSRHub database in Brazil, from 2010 to 2018. The results showed that the ownership structure has some influence over Corporate Social Responsibility in social practices centered in the employees, signaling that higher stakeholding control favors such practices.

Given the above, this research aims to verify how ownership structure influences the dissemination of sustainability reports and the levels of informational disclosure in integrated reporting in the B3-listed companies and attempts to answer the following question: What is the

influence of ownership structure over the dissemination of sustainability and the levels of informational disclosure in integrated reporting in B3-listed companies? This study is theoretically justified by analyzing what influences the dissemination of non mandatory reports regarding ownership structure; empirically, by evaluating in which context such influence actually happens; and, finally, socially, by presenting a critical analysis on the disclosures made, since it is through non mandatory reports that external users get to understand how a company creates and shares social value.

Furthermore, this study seeks to demonstrate that research on CSR or any other social aspect related to ownership structure contributes to the advance of knowledge, mainly to companies that have adopted non mandatory reporting. Also, IR is a very little explored area, so there is a gap in understanding which factors interfere with its disclosure. Thus, this study becomes a contribution to literature, market and professionals in charge of its making, pushing forward the frontiers of knowledge about how ownership structure affects it, especially in an economically emerging country like Brazil.

## Research theoretical elements

### Corporate Social Responsibility (CSR) and Integrated Report (IR)

According to Carroll (1979), one of the main factors that motivate discussions about CSR is the lack of agreement on its concept. In this regard, the author points out that Howard R. Bowen's 1953 publication defined CSR as an obligation that managers have to make decisions and perform actions that go hand in hand with social goals and values. In contrast, Friedman (2009) argued that there is only one CSR: profit maximization as long as companies remain in free competition without deception or fraud.

Ashley (2005) widely contests such an idea by postulating that a company is socially responsible when all its actions contribute positively, either in a broader or more specifically manner, to the improvement of broad social development. This has been advocated by Davis (1975), who stated that social responsibility derives from social power performed by the diverse agents of which society is made, since the actions taken by companies

somehow always affect that same society in a way that it is inconceivable that decisions are made thinking solely of financial aspects.

Bhagwat's study (2011) pointed out that companies must fulfill current social aspirations without compromising future generations' expectations. Therefore, there is a strong demand for CSR information disclosure and one of the factors that motivate awareness and adoption of CSR is a continuous construction of a corporate positive image before society. CSR actions tend to have positive outcomes in the medium and long term, considering that these are resource-consuming activities which are not usually linked to companies' main goal (Freeman, Wicks & Parmar, 2004).

Even though the sustainability report is a way companies have to highlight their actions and socio-environmental impacts caused by their activity, it is optional and structured either according to the criteria for disclosure used by the company or based on pre-existing criteria for sustainable reports such as the Global Reporting Initiative (GRI) or Integrated Reporting (IR) (Campos et al., 2013; Filho, 2002; Wood, 1991).

The report proposed by the GRI is based on qualitative and quantitative indicators and encompasses risks, basic principles and content elements, without failing in showcasing the socio-environmental impacts caused by corporate actions. On the other hand, Integrated Reporting attempts to be an evolutionary milestone on how companies prepare their reports (Simnett & Huggins, 2015).

IR is a report that can be translated into a convergence and reconciling process of corporate communication and management practices as they align the execution and disclosure of corporate business models with the challenge of sustainable development. The report is structured to show the company's financial and non-financial performance, which is what distinguishes it from other sustainability reports (Kassai et al. 2019; King III, 2009).

In Brazil, Technical Guidance OCPC n. 09/2021 directs the preparation and disclosure of IR as a standard for corporate reports to demonstrate the company's strategy, governance, performance and organization perspective integrating the internal and external environment aiming at showing the short, medium and long-

term value generation (Accounting Statement Committee [CPC], 2021).

In this way, it brings up the additions, subtractions and transformations in the most diverse types of resources used by the company in its core business activities. These resources are known as being capital, namely financial, manufactured, intellectual, social and relationship, human and natural (Cheng, Green, Conradiem, Konishi & Romi, 2014).

Moreover, IR also presents content elements and basic principles seeking to provide concise, cohesive, trustworthy, material and forward-looking information by making it logical and harmonical in a way that corporate strategies and values are well depicted (Kassai & Carvalho, 2013; Kassai et al., 2019; Owen, 2013; Soyka, 2013). Nevertheless, it gets some criticism for not encompassing the many idiosyncrasies from each country and management (CEBDS, 2016).

## **Ownership Structure and Sustainability Reporting**

Ownership structure is the way through which companies divide ownership, management and share composition, i.e., how shares are distributed in relation to votes, invested capital and stakeholders (Jensen & Meckling, 1976; Wahl, 2006). Following such logic, there are many factors that influence the ownership structure in a company, for example the way the board of directors (BD) is established; how many members the BD will have; how independent the board is and gender diversity in it (Puchet-Martínez, Gallego-Álvarez & Bel-Ons, 2019).

In Cordeiro, Profumo and Tutore's (2020) view, ownership structure and the stakeholders' characteristics are elements that affect voluntary disclosure, and it has been relevant in asymmetrical information contexts, once some stakeholders might have the ability, motivation and knowledge to avoid information concealing and boost disclosure quality and extension.

According to Almeida, Santos, Cabral, Santos and Pessoa (2015), ownership structure can influence the adoption of policies by a company, mainly the aspects concerning voluntary information disclosure related to corporate sustainability. In Di Domenico et al.'s (2016) and Wahl's (2006) research papers, the authors observed that where the actions came from,

whether ordinary or preferred as well as the features of the controlling investors can influence corporate strategies, including how information disclosure is done and, thus, cause conflicts.

Having said that, Consolandi et al. (2008) noticed a negative relationship between share concentration and CSR when they analyzed 646 European companies from 2001 to 2003. The authors also pointed out that majority stakeholders can stop resources from going to long-term sustainable investments, like in CSR shares cases.

However, Crisóstomo, Freire and Parente (2013) stressed a relationship between ownership structure and corporate social responsibility after having analyzed 64 Brazilian open capital companies from 1997 to 2008. They concluded that corporate social responsibility is positively influenced by ownership concentration in Brazil. Also, the authors highlighted how it might indicate that major stakeholders consider social responsibility an important way to enhance the company's image and reputation, as well as encourage project execution and disclosure.

Similar results were obtained by Pinheiro et al. (2020) when verifying how ownership structure influences Corporate Social Responsibility concerning employee-centered practices, which clarifies that when it comes to companies listed in the Brazilian stock exchange, ownership structure positively influences Corporate Social Responsibility and that higher share concentration favor corporate employee-centered practices.

As for the BD composition, Naseem et al. (2017) studies 179 financial and non financial companies listed in Pakistan's stock exchange from 2009 to 2015 and concluded that having more independent members in a board of directors positively affects ownership structure.

Still according to Naseem et al. (2017), firm size impacts significantly in corporate social responsibility because, as they stated, bigger companies tend to disclose more socio-environmental information to attenuate agency conflicts. Nonetheless, the authors concluded that the ratio of women in the BD does not have any effect in the CSR-related information disclosure.

Naseem et al. (2017) have stated how important the participation of a bigger quantity of independent members in the board is for corporate governance and that independent counselors can avoid agency problems by pressuring managers to

disclose more information and, as a result, better the quality of board monitoring.

Pucheta-Martínez et al.'s (2019) study investigated 204 companies that operated in emerging economies from 2004 to 2015. Their findings showed that the Board's independence is something that positively influences sustainability reporting disclosure while the lack of gender diversity in the Board negatively influences SR disclosure.

Research by Ghazali (2007), Li and Zang (2010), Naseem et al. (2017) Pucheta-Martínez e Chiva-Ortells (2018), Pucheta-Martínez et al. (2019) and Soliman, Sakr & El Din (2012) looked into the relationship between CSR and ownership structure in companies from many different countries. The results of these papers displayed that there is a positive relationship between firm size, gender diversity, Board independence and the level of CSR-related information disclosure. However, there is a negative relationship regarding share concentration (Consolandi et al., 2008).

On the other hand, Fauzi et al. (2007) and Prado-Lorenzo et al. (2009) found no relation between ownership structure and CSR-related information disclosure. Thus, ownership structure can be a determining factor to the level of corporate information disclosure, as the kind of structure can lead to changes in the way companies deal with CSR report disclosure.

## Hypothesis development

Given the literature and pieces of research mentioned, hereby are presented the thoughts and reasonings that led to the development and formulation of hypotheses.

The first hypothesis relates to the effect of share concentration in CSR disclosure. According to the Agency Theory, companies disclose more information when the share structure is more diverse, since the plurality of stakeholders demands the disclosure of more information in order to fulfill the expectations of the biggest number of investors possible (Jensen & Meckling, 1976).

Li & Zhang's study examined how ownership structure affects the corporate social responsibility in emerging markets using the Chinese corporate social responsibility ranking. The results showed that for non-state-owned companies, ownership

dispersion is positively associated with corporate social responsibility.

On the contrary, Consolandi et al. (2008) looked into 646 European companies and verified that there is a negative relation between share concentration and CSR. According to Garas & Elmassah (2018), investors with higher share concentrations hold resources and incentives to perform functions when conducting the company as well as monitoring management actions and decisions, including those related to CSR. Thus the first hypothesis is posited:

H1: The share concentration influences SR and IR disclosure and the RI disclosure level.

The second hypothesis is about the number of board members. According to Pucheta-Martínez and Chiva Ortells (2018), shareholders councils have been increasingly making decisions related to CSR, taking their objectives beyond economic and financial aspects as they also consider environmental and social performance.

Soliman et al. (2012) investigated the 42 most active in the market companies in Egypt and concluded a positive relationship between CSR classifications and ownership structure mainly made of foreign and institutional stakeholders. It demonstrated that a higher number of board members has a positive impact on sustainability reporting disclosure.

Additionally, Naseem et al. (2017) stated that the larger number of board members, the greater diversity regarding the educational level and professional experience, which usually presents a positive relation in the reporting disclosure. Based on these arguments, the second hypothesis of the research is presented:

H2: The participation of more board members influences the SR and IR disclosure and the level of IR disclosure.

Furthermore, the next hypothesis considers the effects of board members' independence on CSR disclosure. According to Biswas, Mansi & Pandey (2018) and Shu and Chiang (2020), companies with greater board independence tend to have better social and environmental performance because greater diversity of independent board members increases board independence and reduce conflicts between managers and shareholders, which encourages managers to be more committed to disclosing social aspects. This assumption is supported by the results of the study by Pucheta-Martínez et al.

(2019), which showed that in emerging countries, this relationship is positive, as well as it is shown in the results of Naseem et al. (2017), obtained in a study of publicly traded companies in Pakistan. However, the study by Pucheta-Martínez and Chiva-Ortells (2018), which analyzed only Spanish companies, found that the presence of independent board members had no effect on the disclosure of corporate social responsibility information. Therefore, the third hypothesis is formulated:

H3: Having a greater number of independent board members influences CSR disclosure, RI, and the level of RI disclosure.

The fourth and final hypothesis concerns the effects of board gender diversity on CSR disclosure. Naseem et al. (2017) found no significance in the relationship between the presence of women on the board and the disclosure of social reports. However, in the study by Pucheta-Martínez et al. (2019), the authors found a negative relationship between a higher number of women on the board and the disclosure of sustainability reports.

The research by Jarboui, Saad, and Riguen (2020) reinforces the differences on the topic, as they stated that the presence of women on the board can act as a mechanism for greater monitoring of activities, and in this sense, the presence of women improves the independence and efficiency of the board by having greater perception and being more effective in monitoring board actions.

Furthermore, female directors are more focused on corporate social responsibility than men and bring different perspectives to the board, enhancing the decision-making process related to social aspects (Adusei, 2019; Cordeiro et al., 2020). Having such considerations in mind, the fourth hypothesis is developed:

H4: The presence of women on the board influences CSR disclosure, RI, and the level of RI disclosure.

## Methodological Elements of the Research

### Population and Sample Selection

The population of this research consisted of 426 companies listed on B3, between the years 2017 and 2018, however, only 376 companies were active. Financial companies were excluded

due to the specificities and legal requirements of this sector, as well as those that did not disclose a reference form and those belonging to the same economic group. In the end, the sample totaled 299 companies from different sectors and 586 observations.

Subsequently, an analysis was conducted on the website of each company to verify if they disclosed corporate social responsibility reports. The following nomenclatures were considered: annual report, sustainability report, social responsibility report, and integrated report. These terminologies were used to gather as much information as possible, as many companies disclose socio-environmental information but with different names.

The analytical observations were performed manually, checking the reference forms of each company for information on ownership structure, as well as in sustainability reports or integrated reports for CSR information. Due to this fact, it was decided to analyze only two years since this type of analysis requires a more detailed examination. Statistical analysis was carried out using Stata 16.

The companies in the sample were analyzed from three perspectives: companies that published any type of Sustainability Reports; companies that published Integrated Reports (IR) or in accordance with IR parameters; and the analysis of the level of informational disclosure of Integrated Reporting for those that published this report.

To assess the level of disclosure of Integrated Reporting, an adaptation was made to the checklist developed by Akhter and Ishihara (2018), in order to better adapt it to the reality of Brazilian companies. In the end, it was verified how many items the company disclosed in relation to the checklist, with this result being presented as a percentage. As for economic and financial data, these were collected from the Economática® database.

### Dependent Variables

Regarding the dependent variables, they were respectively assigned as "disclosure of sustainability reports," "disclosure of integrated reporting," and "level of disclosure of integrated reporting." The disclosure of sustainability reports (DSR) refers to the disclosure of annual sustainability reports that were published in 2017

and 2018. Additionally, the research identified that the guidelines that underpinned the reports were the GRI guidelines, IR, and the companies' own guidelines. Furthermore, this variable was treated as binary - 1 for disclosure and 0 for non-disclosure of sustainability reports. Similarly, the disclosure of integrated reporting (DIR) was determined by the disclosure of an annual report in the years 2017 and 2018, self-declared as an integrated report or categorized as in line with the IIRC framework.

Like DSR, this is a binary variable - 1 for disclosure and 0 for non-disclosure. However, the level of disclosure of integrated reporting (LIRD) was more complex than the other two dependent variables already explained, as it required measuring the items based on the adaptation of the checklist developed by Akhter and Ishihara (2018), which are based on the items suggested by the IR framework.

Table 1  
Variables used in the study

Variable	Description	Specification	Expected Symbol	Source
<b>Variables of Interest</b>				
SC	Share Concentration	Proportion of Share Concentration of the 3 (three) Largest Shareholders of each company	-	Haniffa & Cooke (2005).
NBM	Number of Board Members	Number of Board Members of each company	+	Naseem et al. (2017).
NIBM	Number of Independent Board Members	Proportion of Board Independent Members of each company	+	Arora & Dharwadkar (2011); Naseem et al. (2017).
GDB	Gender Diversity on the Board	Proportion of women participation on the Board of Directors of each company in relation to the total number of members	+	Naseem et al. (2017); Pucheta-Martínez et al. (2019).
<b>Control Variables</b>				
SIZE	Firm Size	Natural Logarithm of Total Assets	+	Donnelly & Mulcahy (2008); Naseem et al. (2017).
DOL	Leverage	Long-term-debt-to-total-asset ratio	-	Samaha, Dahawy, Hussainey & Stapleton (2012).
ROA	Return on Assets	Net profit to total assets ratio	-	Pucheta-Martínez & Chiva-Ortells (2018).

Source: Prepared by the authors.

### Specification of models and analysis techniques

Os The models used in this study were based on the studies by Naseem et al. (2017) and Pucheta-Martínez et al. (2019). To investigate the relationship between the characteristics of the ownership structure of the sample companies and CSR, three models were estimated. For the first and second models that investigated Sustainability

After adapting the checklist, 43 items were analyzed, grouped into 8 content elements, for each company that adopted integrated reporting in the years under analysis. For analysis purposes, points ranging from 0 to 2 were assigned, depending on the item present in the checklist, and the result was determined by the total number of points assigned to the disclosure of strategic, non-financial, and financial information contained in the integrated reports of each company, with the final result presented as a percentage.

### Independent and Control Variables

Table 1 describes the variables of interest and control variables considered in this study.

Report Disclosure (DSR) and Integrated Reporting Disclosure (DIR), binomial logit regression was used to infer the impact that explanatory variables have on the probability of the occurrence of the binary dependent variable (Fávero & Belfiore, 2017), as shown in equations (1) and (2).

The third model that investigated the Level of Integrated Reporting Disclosure (LIRD) was estimated using panel data multiple regression, which, after the Chow F-test, Breusch-Pagan

Lagrangian, and Hausman tests, indicated the Random Effects model as the most suitable, as shown in equation (3). To handle outliers, all numeric variables were winsorized at 1% at the lower and upper bounds.

To meet the assumptions of multiple regression, the Sfrancia test was used, which indicated that the residuals did not follow a normal distribution. The Breusch-Pagan test was used to check for homoscedasticity, indicating that the residuals had constant variance. The Variance Inflation Factor (VIF) test was used to identify possible problems of multicollinearity, with both average and individual values below 3, indicating the absence of relevant correlations. As for the Linktest, which checks for model specification errors, it showed values greater than 5%, indicating that the model was correctly specified.

$$\text{Logit [P(DRS)]} = \ln \left\{ \frac{P(\text{DRS})}{1-P(\text{DRS})} \right\} = \alpha + \beta_1 \text{SC} + \beta_2 \text{NBM} + \beta_3 \text{NIBM} + \beta_4 \text{GDB} + \beta_5 \text{SIZE} + \beta_6 \text{DOL} + \beta_7 \text{ROA} \quad (1)$$

$$\text{Logit [P(DIR)]} = \ln \left\{ \frac{P(\text{DIR})}{1-P(\text{DIR})} \right\} = \alpha + \beta_1 \text{SC} + \beta_2 \text{NBM} + \beta_3 \text{NIBM} + \beta_4 \text{GDB} + \beta_5 \text{SIZE} + \beta_6 \text{DOL} + \beta_7 \text{ROA} \quad (2)$$

$$\text{LIRD}_{it} = \beta_0 + \beta_1 \text{SC}_{it} + \beta_2 \text{NBM}_{it} + \beta_3 \text{NIBM}_{it} + \beta_4 \text{GDB}_{it} + \beta_5 \text{SIZE}_{it} + \beta_6 \text{DOL}_{it} + \beta_7 \text{ROA}_{it} + \varepsilon_{it} \quad (3)$$

## Presentation and Discussion of Results

### Descriptive Statistics

Table 2 presents the descriptive statistics for the sample companies. The results show that, on average, 66% of the total analyzed companies had their shares concentrated in the hands of at most three shareholders (SC), indicating a high ownership concentration in the Brazilian market.

Regarding the number of board members (NBM), the average composition was six people, and in 24% of the cases, there were independent members (NIBM). Regarding the percentage of women on the board (GDB), the average participation was 11%, with a maximum of 33%. It was also observed that in 340 companies, there were no women on the board, indicating a lack of gender diversity in the sample.

As for the disclosure of CSR reports by companies, according to the B3 listing sectors, Table 3 shows that communications was the sector that disclosed the most sustainability reports, which comprehends 60% of its sample companies.

Table 2  
Descriptive Statistics

Variables	N. Obs.	Mean	Median	Standard Deviation	10th Percentile	90th Percentile
SC	586	0,66	0,64	0,26	0,31	1,00
NBM	586	6,25	6,00	2,54	3,00	10,00
NIBM	586	0,24	0,20	0,26	0,00	0,60
GDB	586	0,11	0,00	0,18	0,00	0,33
SIZE	586	13,90	14,32	3,03	10,98	17,16
DOL	586	0,72	0,31	3,85	0,05	0,76
ROA	586	-26,71	2,36	239,07	-21,32	12,01

**Source:** Prepared by the authors

**Note:** SC – Share Concentration; NBM – Number of Board Members; NIBM – Number of Independent Board Members; GDB – Gender Diversity on the Board; SIZE – Firm Size; DOL – Leverage; ROA – Return on Assets; N. Obs. – Number of observations.

In contrast, the sector that disclosed the least reports - except for the "others" sector, with a disclosure percentage of 0% - was the cyclical stock one, with an only 12.75% disclosure rate.

Regarding integrated reporting, Table 3 shows that the sector that mostly adopted it was the oil, gas, and biofuels sector, with 29.41%, followed by the utilities sector, which brings a 29.27% value. This can be justified by Brazilian Law No.

13.303/2016, which requires "public companies and mixed-capital companies to observe, at least, transparency requirements in the annual disclosure of integrated or sustainability reports." Additionally, the disclosure of the environmental report by ANEEL (National Electric Energy

Agency) is important for the level of environmental information disclosure.

Table 3  
Analysis of reports presented by companies by sector

Sector	Number of Reports	Disclose SR	Don't disclose SR	Disclose IR	Don't disclose IR
Industrial Goods	123	19 (15,45%)	104 (84,55%)	14 (11,38%)	109 (88,62%)
Communications	10	6 (60,00%)	4 (40,00%)	2 (20,00%)	8 (80,00%)
Cyclical Stock	149	19 (12,75%)	130 (87,25%)	8 (5,37%)	141 (94,63%)
Non-cyclical Stock	49	21 (42,86%)	28 (57,14%)	5 (10,20%)	44 (89,80%)
Basic Materials	58	13 (22,41%)	45 (77,59%)	8 (13,79%)	50 (86,21%)
Others	50	0 (0,00%)	50 (100,00%)	1 (2,00%)	49 (98,00%)
Oil, Gas and Biofuels	17	3 (17,65%)	14 (82,35%)	5 (29,41%)	12 (70,59%)
Health	36	5 (13,89%)	31 (86,11%)	3 (8,33%)	33 (91,67%)
Information Technology	12	3 (25,00%)	9 (75,00%)	1 (8,33%)	11 (91,67%)
Public Utility	82	31 (37,80%)	51 (62,20%)	24 (29,27%)	58 (70,73%)
Total	586	120 (20,48%)	466 (79,52%)	71 (12,12%)	515 (87,88%)

Source: Prepared by the authors

Note: SR = Sustainability Report; IR = Integrated Report.

## Multivariate analysis

Integrated Reporting (DIR); and Level of Integrated Reporting Disclosure (LIRD).

The results presented in Table 4 show the statistical estimates for the three dependent variables or variables of interest: Disclosure of Sustainability Reports (DSR); Disclosure of

Table 4  
Result das Regressions: Binary and Multinomial Logit with Panel Data

Variables	DSR	DSR Odds ratio	DIR	DIR Odds ratio	LIRD
SC	-0.4651092 (2.625087)	0.76	2.08756 (2.668554)	1.63	0.0516471 (0.0708985)
NBM	1.558267*** (0.266853)	1.21*** 0.21	0.437557* (0.2466049)	1.20*** 0.20	0.0193006*** (0.0069638)
NIBM	2.51138 (2.419306)	1.59	7.700992*** (2.941649)	6.57*** 5.57	0.020161 (0.0554758)
GDB	-0.5010727 (5.340346)	0.34	4.516166 (4.184794)	10.71	0.0511058 (0.1039677)
SIZE	1.355091*** (0.2650973)	1.35*** 0.35	1.918248*** (0.5383734)	1.72*** 0.72	-0.0057484 (0.0116771)
DOL	-0.449828 (2.139933)	0.85	-0.4151291 (1.721103)	0.94	0.0810724 (0.0850501)
ROA	-0.0013282 (0.0018797)	0.99	0.0024211 (0.0057889)	1.00	0.002665 (0.0027183)
Constant	-41.28319*** (4.088477)	0.00***	-44.34918*** (10.42891)	2.72***	0.2260634 (0.1911269)
LR Qui-Quadrado	158.01	97.74	84.22	113.65	-

Chi2 prob	0.0000	0.0000	0.0098	0.0000	0.1756
N. Obs.	586	586	586	586	71

**Source:** Prepared by the authors.

**Note:** DRS - Disclosure of Sustainability Reports; DIR - Disclosure of Integrated Reporting; LIRD - Level of Integrated Reporting Disclosure; SC - Share Concentration; NBM - Number of Board Members; NIBM - Number of Independent Board Members; GDB - Gender Diversity on the Board; SIZE - Company Size; DOL - Leverage; ROA - Return on Assets. Values between parentheses ( ) represent the standard error of the regression. The significance is given by: \*\*\*(1%), \*\*(5%), and \*(10%).

In the first model that investigated the characteristics of ownership structure related to the disclosure of sustainability reports (DRS), the only statistically significant variables were Number of Board Members (NBM) and Firm Size (SIZE), both at a 1% level, as shown in Table 4.

The variable NBM had a plus sign, indicating that the greater the number of board members, the higher the probability of companies to publish sustainability reports. Each additional board member increases the chances of a company disclosing sustainability reports by 21% (Odds Ratio of 1.21). This result is supported by Naseem et al.'s (2017), Pucheta-Martínez & Chiva-Ortells's (2018) and Soliman et al.'s (2012) studies, which came to similar conclusions.

Next, the variable representing firm size also had a plus sign, suggesting that larger companies are more likely to disclose sustainability reports. This finding reinforces the results found by Naseem et al. (2017), as larger companies tend to disclose more socio-environmental information when the focus is on mitigating agency conflicts.

The variables SC, NIBM, GDB, DOL and ROA did not show statistical significance at any level, which leads us to believe that, for the sample considered in this research, there is no statistical evidence of their influence on the disclosure of CSR reports. It is worth noting that in the study done by Pucheta-Martínez and Chiva-Ortells (2018), the variables ROA and DOL did not show any level of significance either.

In the second model that investigated the characteristics of ownership structure related to the disclosure of Integrated Reporting (DIR), the significant variables were Number of Board Members (NBM), Number of Independent Board Members (NIBM) and Firm Size (SIZE) at a 1% level, and Gender Diversity on the Board (DGC) at a 5% level.

For the NBM variable, a plus sign was observed, implying that the greater the number of board members, the higher the probability of companies to publish integrated reports. This result aligns with those found by Naseem et al. (2017).

The estimated odds ratio indicated that each additional board member increases the chance of a company disclosing Integrated Reporting by 20%.

Similarly, the results indicated that the higher the proportion of independent board members (NIBM), the more likely companies are to publish integrated reports. According to Biswas et al. (2018), companies with more independent members on their boards tend to produce more transparent information, which aids in disclosing social and environmental performance.

Lastly, the variable representing company size was positively related, suggesting that larger companies are more likely to adopt integrated reporting. Such results are consistent with the findings about disclosure of sustainability reports and confirm the Naseem et al.'s (2017) findings.

Regarding the model that investigated the characteristics of ownership structure related to the level of Integrated Reporting disclosure (LIRD), only the Number of Board Members (NBM) variable was considered significant at a 1% level and marked with a positive sign. It indicates that the more board members a company has, the higher the level of Integrated Reporting disclosure in accordance with the guidelines described in the Integrated Reporting Framework it will have. This result is aligned with Naseem et al.'s (2017) and Pucheta-Martínez & Chiva-Ortells's (2018) studies, as they show that the greater the number of board members, the more engaged the company is when it comes to sustainability issues, as boards have been increasingly making decisions about CSR beyond economic matters, as they can gain reputation and add value by adopting an ethical and transparent attitude.

## Analysis of Research Hypotheses

As for hypothesis H1, - ownership concentration influences the disclosure of SR (Sustainability Reports), IR (Integrated Reporting), and the level of IR disclosure -, out of the three models estimated to validate this hypothesis, none were statistically significant.

Taking the results into consideration, hypothesis 1 could not be confirmed based on statistical evidence, which means it's not possible to check if higher share concentration influences the disclosure of sustainability reports, integrated reporting and the level of IR disclosure.

Regarding hypothesis, H2 - a higher number of members in the board of directors influences the disclosure of SR, IR, and the level of IR disclosure -, it is worth mentioning that the NBM (Number of Board Members) variable showed significance in all three models; thus, there is sufficient statistical evidence to not reject this hypothesis. Therefore, a greater number of members in the board of directors tend to influence the disclosure of sustainability reports, integrated reporting, and the level of IR disclosure.

When dealing with hypothesis, H3 - the presence of a greater number of independent members in the board of directors influences the disclosure of SR, IR, and the level of IR disclosure -, the only model that showed significance was the one investigating the adoption of Integrated Reporting (DIR). Therefore, the hypothesis that the presence of more independent members in the board of directors influences the choice to disclose Integrated Reporting cannot be rejected.

For the fourth and final hypothesis, H4 - the participation of women in the board of directors influences the disclosure of SR, IR, and the level of IR disclosure -, the results did not show enough statistical evidence to confirm it, as the variable GDB (Gender Diversity in the Board) did not show significance in any of the three models. This result differs from the findings by Jarboui et al. (2020), in which the authors emphasized that the presence of women on the board of directors influences actions related to CSR and improves information quality. However, it aligns with Naseem et al. (2017), who found no statistical significance in the relationship between the presence of women in the board of directors and the disclosure of non-mandatory social reports.

All in all, it was found that a higher number of board members had a positive influence on the disclosure of sustainability reports, integrated reporting, and the level of IR disclosure. Also, the presence of a greater number of independent members on the board positively influenced the disclosure of integrated reporting. These results go hand in hand with Pinheiro et al. (2020), who

pointed out that ownership structure has an influence on Corporate Social Responsibility.

## Final Remarks

This research aimed to examine the influence of ownership structure on the disclosure of sustainability reports, integrated reporting, and the level of information disclosure in integrated reporting. Four hypotheses were formulated regarding the characteristics of companies' ownership structure and the adoption and disclosure of sustainability information.

The first hypothesis, which comprehends the influence of ownership concentration on sustainability disclosure practices, was not confirmed due to the absence of statistical evidence. Therefore, it was not possible to conclude that ownership concentration influences the disclosure of Sustainability Reports (SR), Integrated Reporting (IR), and the level of IR disclosure. However, based on Assaf Neto (2021), one of the most prominent characteristics of the national market is the presence of high ownership concentration, as also observed in descriptive statistics. This shows that, on average, 66% of the companies in the sample have ownership concentration, and this positively impacts the likelihood of companies disclosing sustainability reports and integrated reporting.

Nonetheless, the second hypothesis was confirmed. It was in regards to the influence of the number of board members and their effects on sustainability disclosure. This indicates that a greater number of board members influences the disclosure of SR, IR, and the level of IR disclosure.

The third hypothesis, which dealt with the proportion of independent board members and their influence on sustainability disclosure, was confirmed, indicating an influence on the disclosure of Integrated Reporting (IR) only. Finally, the fourth hypothesis in the study was not confirmed due to a lack of statistical evidence, which verified the impact of board gender diversity and sustainability disclosure practices. It happened because the variable of interest related to the presence of women on the board did not show statistical significance at any level or model.

Furthermore, this research demonstrated that a greater number of members on the Board of Directors had a positive influence on the disclosure of sustainability reports, integrated reporting, and

the level of IR disclosure. In addition, the presence of a greater number of independent members on the board positively influenced the disclosure of integrated reporting. These results align with those found by Pinheiro et al. (2020), who indicated that ownership structure influences Corporate Social Responsibility.

These findings contribute to demonstrating the impact of board composition and other characteristics of ownership structure on companies' environmental, social, and governance information disclosure practices. They provide evidence that a higher number of board members and a higher proportion of independent members can be important factors in engaging in transparency actions related to the disclosure of their environmental, social, and governance effects.

The results also stimulate further discussion about the effects of ownership structure characteristics on the adoption and disclosure of corporate sustainability reports. This can assist companies, investors, and regulatory bodies in understanding the potential effects of board composition on concerns related to transparency and sustainability disclosure.

Nevertheless, a limitation of this research is the small number of observations in the sample due to the low number of open capital Brazilian companies that disclose sustainability reports, which increases the difficulty in conducting statistically robust analyses. For future research, it is recommended to include variables that were not considered in this study, as well as extending the time frame to form larger samples or even samples including financial companies.

Additionally, there remains the suggestion for an analysis of the topic in light of Legitimacy and Institutional Theories, so that these study possibilities can generate more effective models and increase their efficiency, leading to greater explanations of the relationship between ownership structure and the level of disclosure of non-mandatory reports.

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