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ASSESSMENT OF ESG PRACTICES IN BANKS LISTED IN [B]^3: VERIFYING THE EFFECT OF THE COMPOSITION OF THE BOARD OF DIRECTORS AND CHARACTERISTICS OF FIRMS

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ABSTRACT

We sought to analyze whether the corporate governance characteristics of the Board of Directors (BoD), the capital structure, and the economic and financial performance of the firms influence the adoption of Environmental, Social, and Governance Policies (ESG) by banking institutions listed on the Brasil Bolsa Balcão [B]^3. To this end, 24 banks listed in [B]^3 were analyzed, via annual data made available from 2013 to 2020, in the Thomson Reuters® database and on the [[B]^3 website, mainly through the analysis of Reference Forms of the institutions studied. To analyze the results, the *Tobit* regression model was estimated, using as a dependent variable the 'assessment of ESG practices', measured by an index ranging from 0 (for firms without ESG practices and/or without ESG assessment in the Refinitiv® database) to 100 (firms with best ESG practices) and, for independent variables, characterizations of banking firms and BoD, capital structure, and economic-financial performance indicators were used. Based on the results, it was noted that the size of the banks and the gender diversity of the BoD presented positive and significant statistics, demonstrating that larger banks with more women on the board tend to maintain ESG best practices. On the other hand, negative and significant statistical relationships were observed between the issuance of *American Depositary Receive* (ADRs), the number of independent Board members, and Board Interlocking (B.I.) practices and ESG best practices. However, the study contributes to the literature with the understanding of ESG events of Brazilian banks and with the regulatory demands of the Central Bank of Brazil as a result of the rules with

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requirements of Social and Environmental Responsibility by the regulatory body, as well as with the demands of stakeholders and the market for best ESG practices of banks.

Keywords: Board of Directors. *Board Interlocking*. ESG. Banks.

1 INTRODUCTION

Firms, for several reasons, such as institutional pressures imposed by investors, increasingly work to optimize their performance beyond financial, including investing in Corporate Social Responsibility (Champagne et al., 2021). The sustainable development goals established by the United Nations (UN) require a strong involvement of the public and private sectors in this perspective, causing non-governmental organizations (NGOs) and stockholders to press for firms' actions to be linked to responsibility, socio-environmental impacts, and concern for a more sustainable world (UNDESA, 2015).

In Europe, the perceived relevance of financial sustainability is mainly due to the European Commission's commitment to promote the integration of ESG parameters in all aspects of the financial system (Murè et al., 2021). Moreover, the banking sector is heavily regulated and has a large number of stakeholders who are holders of securities or their stockholders (Azmi et al., 2021); allied to stakeholders, regulators create a high demand for social interests for ESG in this segment, justifying the importance of the study. Thus, some research has been conducted in this regard.

For example, in Brazil, the research by Santos et al. (2022) verified whether there is an influence of gender diversity on the Audit Committee, given the disclosure of environmental information from organizations listed in [B]^3. Dandaro and Lima (2022) sought to verify the relationship between ESG performance and credit risk of publicly-traded Latin American firms, and it is a study aimed at underdeveloped economies, following previous studies that have already assessed developed countries. The study by Guimarães and Malaquias (2022) analyzed the risk-adjusted performance of funds that are linked to the environmental, social, and governance (ESG) approach, considering periods of financial restrictions, as well as the period impacted by the Covid-19 Pandemic.

Macedo et al. (2022) analyzed the effect resulting from the adoption of ESG practices on the value and cost of capital of Brazilian firms. They found a positive relationship between the firm's value, capital cost, and ESG score. The study by Peyerl et al. (2022) sought to analyze the cause-effect relationship between sustainable performance through the Thomson Reuters ESG score and the market performance of Brazilian organizations listed in [B]^3. Finally, Silva Júnior et al. (2022) studied the relationship between Corporate Social Responsibility, with the Thomson Reuters ESG sustainability score, and the Corporate Insolvency forecast. However, this research analyzed non-financial firms listed in Brasil, Bolsa, Balcão ([B]^3). Thus, it is evident that, in Brazil, there is a shortage of studies assessing financial institutions and ESG practices.

Also, in addition to the literature based on previous studies, the environmental theme is also relevant to the credit market, as the Central Bank of Brazil (BCB) requires all financial institutions to carry out and apply Social and Environmental Responsibility Policies (SERP) to manage the social and environmental risks to which they are exposed and mitigate their impacts. The Resolution of the National Monetary Council (CMN) 4,327 of 2014, which implemented the SERP in the Brazilian banking market, aimed to insert Brazil in a prominent position in the international scenario, increasing competitiveness and based on the best international practices of sustainable economic development, justifying the theme assessed in this study for the market and the advancement of the literature.

Regarding the literature, it was noticed that studies have been carried out bringing the relationship of organizational characteristics of firms with ESG, such as the research by Mohammad and Wasiuzzaman (2021), which assessed the interaction of the competitive

advantage of an ESG disclosure on its effect on performance regarding the creation of wealth to stockholders or the improvement of the reputation of firms. Based on the Legitimacy Theory, Eliwa et al. (2019) empirically examined the disclosure and ESG performance of firms on their cost of debt, evidencing in the study that ESG practices determine the credibility of a firm through credit institutions. In this context, credit institutions incorporate firms' ESG information into their loan decisions to assess the types of risks imposed by these firms: default risk and reputation risk (Weber et al., 2010; Weber et al., 2012).

Moreover, emerging international studies seek to assess how firms respond to sustainability and corporate governance aspects to serve stockholders and other stakeholders (Eliwa et al., 2019; Azmi et al., 2021). The previous study by Hussain et al. (2018) empirically investigated the relationship between corporate governance and sustainability performance of the triple bottom line through the framework of agency theory and stakeholder theory of the 100 American firms on the Global Fortune 2013 high-performance list; Barros (2017) verified the essays on Board Interlocking in the Brazilian capital market; and Ribeiro (2019) assessed the relationship between Board Interlocking practices and accounting choices of Brazilian firms listed in [B]^3.

However, studies investigating the relationship between the corporate governance structure, characteristics of the Board of Directors, and sustainable, social, and governance practices in banking institutions were not assessed in the national and international literature, which is the study's contribution. Based on the studies addressed and in the context of the banking market, this study aims to analyze whether the corporate governance characteristics of the board of directors, the capital structure, and the economic and financial performance of the firms influence ESG practices in the banking institutions listed in [B]^3.

Investors, market agents, fund investors, and bank managers stand out as stakeholders in the research and regulatory bodies of Brazilian financial institutions. It is also justified to apply the research in relation to financial institutions, as they are financiers and financed by the capital market. It should thus apply policies of socio-environmental responsibilities in their normative business, such as the Resolution of the Central Bank of Brazil (BCB) No. 4,327 of 2014.

In assessing the relationship between the board structure, capital structure, and economic-financial performance of banks regarding their adoptions of ESG practices, this study reveals many aspects of the causal link to better sustainability practices of financial institutions. This study adds new evidence to the existing body of knowledge about the relationships between the characteristics of a firm and the dimensions of sustainability. It corroborates arguments about the interconnections between different dimensions of sustainability and its relative importance in the adequacy of social and environmental risk policies in the credit and capital markets as a result of the group of banks listed in [B]^3 has been the subject of this research.

In line with the recommendations of the United Nations, which defined that firms disclose their ESG practices by the year 2030 (SSE, 2015), the relevance of this research is supported by the relationship of corporate governance mechanisms from the perspective of Agency Theory and the increasing level of insistence of stakeholders for investments in firms with excellent ESG tools, from the perspective of Private Interest Theory (Azmi et al., 2021).

Also, the research contributes to the practical implications of the regulatory character of the Central Bank of Brazil as a result of the demands of stakeholders and the market for best ESG practices of banks. There is also a contribution to the implications for the literature, from the assessment of the analysis of the released credit portfolio size characteristics and the issuance of stocks in the American market (ADRs) of Brazilian banking institutions, relating them to the ESG practices of the firms. The inclusion of the characteristics of the Board of Directors in the assessment model of ESG practices is evidenced, following the Stakeholder and the Agency Theories, in order to improve the understanding of the phenomenon that drives the best environmental, social, and governance levels of Brazilian banks.

Thus, the study recognizes the gap of a single theoretical framework and supports adopting different theories to study different corporate, social, and environmental governance dimensions. The results can also guide future studies: showing that the expected effect is often limited to one dimension of environmental sustainability, but must involve social and governance aspects, as these are of great value for sustainable development and the community where firms are inserted.

Finally, the results of this study show that the characteristics of banks inherent to size and gender diversity, with a greater female presence on the Boards of Directors, are positively related to the occurrences of best practices and ESG levels of financial institutions, corroborating the previous literature by Murè et al. (2021), Zhang et al. (2012) and Naciti (2019). This implies that the boards of directors with a greater female presence among their members and a higher level of bank size tend to meet the demands of stakeholders and regulators, such as BCB, for better ESG practices. However, the characteristics of issuing stocks in the banks' American market, Board Interlocking practices among the banks, and the number of independent members of the board of directors, are negatively related to the occurrences of best practices and ESG levels of the institutions. This implies that the sharing of members and their independence before the boards of directors of the banks and the participation of financial institutions in a developed country such as the United States does not always mean the involvement of institutions with best ESG practices in managing the banking institution.

2 THEORETICAL FRAMEWORK AND PREPARATION OF HYPOTHESES

2.1 Governance, Board of Directors, and Adoption of ESG Practices

The expansion of firms and capital markets from the 20th century increased the rupture between owners and management controls in firms once the command was pulverized, resulting in conflicts and distances between stockholders and managers (executives). In a pioneering study with US and British firms, Jensen and Meckling (1976) determined the agency relationship as a contractual instrument in which one or more people, "principal(s)", engage with another person, "the agent", to perform some task on their behalf, which involves the delegation of authority for decision-making from the principal to the agent, which originated the Agency Theory.

The conflict of interest among stakeholders, studied by the Agency Theory of Fama and Jensen (1983), can be resolved through the adoption of best corporate governance practices. Therefore, Claessens and Yurtoglu (2012) define corporate governance "as the existing way to resolve collective action problems among dispersed investors and resolve conflicts of interest between various corporate claimholders". Moreover, corporate governance is considered a set of standards designated as "good practices" that maintain the purpose of optimizing the performance of firms since such practices seek to protect stakeholders and stockholders from deviations by those individuals with the power to influence or make decisions on behalf of the organization (Comissão de Valores Mobiliários, 2002).

Thus, firms can use two types of control instruments: internal and external, depending on the environment. The internal mechanisms, for example, would be the Board of Directors, the concentration of ownership, and executive compensation. Within the scope of external mechanisms, the literature prevails over the obligation to frequently disclose information about the firm, its regulatory and legal environment, the accounting regulations in force, the rules of the capital market, and the activism of investors and stockholders, among others (Jensen, 1983).

Good corporate governance expresses shared responsibility, also built by the result of operational and strategic choices made by the various stakeholders involved, according to Naciti (2019). Studies show there is no model of good governance, but any model depends a lot on how the different interests of the parties involved are combined (Naciti, 2019).

In this scenario, the members, in particular, represent the main internal mechanism of corporate governance due to their important role in decision-making in a firm (Zahra, 1993;

García-Sanchez & Martinez-Ferrero, 2018) and in assessing the actions of managers, as well as suspending their powers and hiring new managers (Fama & Jensen, 1983), thus protecting the interests of stockholders (Comet & Pizarro, 2011). Besides, researchers and professionals understand that the board of directors has a role in associating ESG practices with firms' strategies (Cooper & Uzun, 2022).

As for the Boards of Directors, it is regularly verified in the international and Brazilian corporate context that they may be connected in the form of a network, which occurs when a certain member also occupies other seats in multiple firms. Board Interlocking (B.I.) causes significant reflexes (Barros, 2017; Ribeiro, 2019). Such reflections refer to both the improvement of governance and the economic and social performance of firms since it was found that members who occupy several boards of directors simultaneously have better total ESG scores, as well as in each component particularly (Cooper & Uzun, 2022).

An explanation for a positive relationship between ESG practices and the B.I. is due to the view that members who occupy several boards are competent and experienced. Therefore, to maintain this reputation, they act more rigorously in their internal monitoring (Cooper & Uzun, 2021), obtaining more accurate and timely information, especially regarding meeting stakeholders' desires. Thus, this ability to serve them results in higher ESG performances (Swanson & Orlitzky, 2018).

It is also verified that women play a fundamental role in developing self-awareness regarding socio-environmental responsibility and governance. Proof of this were the studies by Zhang et al. (2012) and Naciti (2019), which evidenced in their results the greater presence of women on the Boards of Directors as a common variable for a positive and significant impact on the best social, environmental, and governance practices of firms.

The understanding of such a relationship (number of women on the board versus ESG practices) is due to women's personality traits, such as helpfulness and sensitivity, as well as educational aspects and professional experiences (Kyaw et al. 2017; Manita et al., 2018). Thus, women present more empathy to the expectations of stakeholders and sustainable practices (Samara et al., 2019) than men, thus being a factor that contributes to greater adoption of ESG practices in firms.

In this context, the literature explains the relationship between corporate governance and ESG practices based on two dominant theories: Agency Theory (Jensen & Meckling, 1976) and Stakeholder Theory (Freeman, 1984). The first describes management and governance problems in the relationships between principal and agent. A conflict relationship can arise when the agent's goals differ from the principal's goals. This is due to information asymmetry, opportunistic behavior, and conflict of interest between managers and stockholders (Ortas et al., 2015). Therefore, to reconcile the agent's goals with those of the principal, the Agency Theory suggests a separation of decision-making between managers and stockholders and a discretion of the manager to the individual benefits arising from the position held (Fama & Jensen, 1983).

Stakeholder theory identifies with whom, in concrete terms, firms should relate in their operations. It is the starting point for reflection on how firms obtain and lose their social legitimacy. In general, stakeholders are composed of different categories: stockholders, creditors, employees, suppliers, institutions, consumers, and the local community (Freeman, 1984). Considering that demands and preferences are conflicting among powerful stakeholders, it is understood that organizations that focus on corporate social responsibility for various stakeholders are likely to provide a clearer explanation of their performance, making better quality environmental information available (Liao et al., 2014).

In short, based on Agency Theory, it is indicated that managers' interests must align with those of stockholders through strong corporate governance mechanisms (Grove et al., 2011). Agency Theory predicts that a bank's performance is linked to management and board incentives (Harkin et al., 2019). Also, corporate managers must consider stakeholders' interests, arising from

Stakeholder Theory, to reduce the chance of a conflict of interest (Haniffa & Cooke, 2002) and obtain corporate social responsibility (Naciti, 2019). In this regard, Michelon and Parbonetti (2012) argue that excellent corporate governance uses sustainable performance to improve the relationship between the firm and its stakeholders.

Thus, the composition of the Boards of Directors, which represent prerogatives of the quality of the governance mechanisms of banking institutions, are the variables of gender diversity, independence, and Board Interlocking practices of the members, which impact the adoption of ESG practices (Hussain et al., 2018; Barros, 2017; Ribeiro, 2019), justifying the formulations of the following hypotheses:

H_1: There is a positive relationship between the gender diversity of the members of the Boards of Directors of banking institutions and the adoption of ESG practices.

H_2: There is a positive relationship between the independent members of the Boards of Directors of banking institutions and the adoption of ESG practices.

H_3: There is a positive relationship between Board Interlocking practices of banking institutions and the adoption of ESG practices.

2.2 Adoption of ESG Practices and Characteristics of Banking Institutions

Stakeholder Theory states that a responsible bank meets the demands of social players while disclosing environmental values in its value chain (Batae et al., 2021). To be sustainable, a firm must minimize its use of non-renewable resources and its emissions of pollutants, corresponding this definition to the strong meaning of sustainability.

In addition, firms must contribute to social development by reducing unemployment, using long-term considerations and success indicators (Weber et al., 2010). In this context, Brazilian banking institutions are relevant firms for assessing and granting sustainable credits to the market. Banking financial institutions offer credits to the market, requiring assessments of the levels of credit management offered in the banking business.

Determining this management also involves the sustainability risks of the clients taking the values with the institutions. Environmental, social, and governance risks cause uncertainty about the future result of loans to an emerging creditor and influence a firm's economic performance regarding its solvency or future earnings (Weber et al., 2010).

The main link between the financial sector and sustainable development is through loans or investments in firms with better ESG levels and lower financial risks, contributing to a more sustainable market (Weber et al., 2012). Also, the financial sector focused on environmental risk management of its businesses, integrating sustainability risk with credit risk management. At the same time, socio-environmental risk assessments are also enriched in the Brazilian financial segment, resulting from the Central Bank of Brazil (BCB) regulation through the Resolution of the National Monetary Council No. 4,327 of April 25, 2014.

In this sense, there is evidence of studies in developed countries on firms that present a positive association between the adoption or disclosure of ESG and the lower risk of credits. In addition to better long-term performance, financial institutions value these firms' efforts in disclosing ESG, rewarding firms through lower debt costs (Eliwa et al., 2019).

Crifo et al. (2017) suggest that loan costs or yield spreads are lower in countries where ESG disclosures are high. Lower yield spreads allow firms to gain a competitive advantage with maximized results, lower risks, and lower financial expenses (Mohammad & Wasiuzzaman, 2021). Besides, it is argued that firms adopting corporate social responsibility (CSR) strategies have better credit conditions since they increase stakeholder engagement and transparency (Cheng et al., 2014). Therefore, firms with greater ESG disclosure are expected to have lower indebtedness.

Emerging market banks that engage in activities that maximize transparency and improve corporate governance are expected to experience a decline in their external financing costs.

Therefore, banks that engage in more ESG activities expose superior financial performance to that of their less ESG-inclined competitors (Azmi et al., 2021). These aspects are explained based on the Agency Theory since managers of better-performing firms will disclose more information to obtain personal benefits. Thus, they will disclose detailed socio-environmental information to maintain their positions and compensations (Sharma et al., 2020).

Chowdhury et al. (2021) also observed that all three ESG dimensions are positively and significantly related to the ADR indicator. Thus, it was noted that corporate social responsibility information disclosures increase when firms list their stocks in the United States markets. The results were explained by the fact that stocks listed in the United States have less volatility, greater liquidity, and greater institutional ownership, which motivates ADR firms to disclose more ESG information compared to similar firms.

Still based on Agency Theory, larger firms have asymmetric information. This results in higher agency costs (Jensen & Meckling, 1976), the main reason for disclosing ESG information (El Khoury et al., 2023). Furthermore, based on the Stakeholder theory, the firm size is the main reason for disclosing more information, in order to obtain social legitimacy (Magali et al., 2019) because as larger firms are more viewed by society than smaller firms, they are more pressured to disclose ESG information to demonstrate the implementation of their social responsibilities (Rahman & Alsayegh., 2021).

On the other hand, failure to meet society's expectations may lead to sanctions imposed in the form of legal restrictions on a firm's operations or through the provision to the firm of limited resources (Deegan & Unerman, 2011). This may impact the quantity and/or quality of its operations. Thus, banks with greater corporate social responsibility or more ESG practices are expected to hold a more significant number of credit operations (granting loans or financing, for example).

Therefore, banks are considered public interest entities with great responsibility in relation to their stakeholders, and any of their failures would negatively affect society (Batae et al., 2021). According to Stakeholder Theory, the characteristics of banking institutions, such as firm size, return on assets, issuance of ADRs, credit operations, and bank debts, impact the adoption of ESG practices by firms, emerging in the following research hypotheses:

H_{4a}: There is a positive relationship between the size of banking institutions and the adoption of ESG practices.

H_{4b}: There is a positive relationship between the performance of banking institutions (measured by ROA) and the adoption of ESG practices.

H_{4c}: There is a positive relationship between the issuance of ADRs by banking institutions and the adoption of ESG practices.

H_{4d}: There is a positive relationship between the number of credit operations of banking institutions and the adoption of ESG practices.

H_{4e}: There is a negative relationship between the level of indebtedness of banking institutions and the adoption of ESG practices.

3 METHODOLOGICAL PROCEDURES

3.1 Sample and Data

The research population comprises the 27 firms listed in the financial segment, the financial intermediation subsector, and the banking segment of the stock exchange Brasil, Bolsa, Balcão [B]^3. Of these firms, 24 firms were analyzed in the research sample as a result of the presentation of data in the analysis period between 2013 and 2020, excluding the banks Modal S/A (justification was the initial public offer only on 04/28/2021), BR Advisory Partners Participações S/A (the justification was the initial public offer on 05/13/2021), China Construction Bank (Brazil) and Bco Múltiplo S/A (the justification for their exclusion was the non-accessibility to data). The research

sample corresponds to 88% of the total banks listed in [B][3], representing a significant analysis of the segment to be studied.

However, there is a limitation regarding the number of banks assessed in the sample since 24 banks were used in this study, and the asymptotic results are compromised. Thus, due to the limitations in the number of observations, given that the research studied only the banks listed in B3, the results of the study inferences should be assessed with caution.

Although there is a statistical limitation regarding the findings and inferences found, the study is justified by assessing the banking sector, considering the relevance of these institutions for the country's economy, as they structure the financial credit system, interconnecting surplus and deficit agents economically. Besides, of the 6 (six) largest banks in Brazil classified in segment S1 of the Central Bank of Brazil, according to CMN Resolution No. 4,553 of 2017, the study verified 5 (five) of these institutions, namely: BTG Pactual, Bradesco, Banco do Brasil, Itaú, and Santander, which have a configuration that corresponds to 10% or more of the country's Gross Domestic Product (GDP), in addition to developing relevant international activities.

Table 1

Description of the research sample with the number of observations

Ord.	Corporate Name	Number of observations per year	Ord.	Corporate Name	Number of observations per year
1	ALFA HOLDINGS S.A.	**8**	13	BCO ESTADO DO RIO GRANDE DO SUL S.A.	**8**
2	BANCO BMG S.A.	**3** (2018, 2019, and 2020)	14	BCO MERCANTIL DE INVESTIMENTOS S.A.	**8**
3	BANCO INTER S.A.	**3** (2018, 2019, and 2020)	15	BCO MERCANTIL DO BRASIL S.A.	**8**
4	BANESTES S.A. - BCO EST ESPÍRITO SANTO	**8**	16	BCO NORDESTE DO BRASIL S.A.	**8**
5	BCO ABC BRASIL S.A.	**8**	17	BCO PAN S.A.	**8**
6	BCO ALFA DE INVESTIMENTO S.A.	**8**	18	BCO PINE S.A.	**8**
7	BCO AMAZÔNIA S.A.	**8**	19	BCO SANTANDER (BRASIL) S.A.	**8**
8	BCO BRADESCO S.A.	**8**	20	BCO SOFISA S.A.	**4** (2013, 2014, 2015, and 2016)
9	BCO BRASIL S.A.	**8**	21	BRB BCO DE BRASÍLIA S.A.	**8**
10	BCO BTG PACTUAL S.A.	**8**	22	ITAÚ UNIBANCO HOLDING S.A.	**8**
11	BCO ESTADO DE SERGIPE S.A. – BANESE	**8**	23	ITAÚSA S.A.	**8**
12	BCO ESTADO DO PARÁ S.A.	**8**	24	PARANÁ BCO S.A.	**8**
Total study observations					**178**

Source: Research data (2023).

The assessment of the target data began in 2013, as it was the data generated after the Rio+20 conference in 2012, held in Rio de Janeiro-RJ, whose objective was to renew the political commitment to sustainable development, directing firms to common sustainability goals. For the banks analyzed in the sample, the distribution of the 178 observations assessed from 2013 to 2020 (8 years/observations) by institution is detailed below, with only BMG, Inter, and Sofisa banks without the complement in the number of observations in the period analyzed, by entry or exit in [B][3] during the period object of the study.

3.2 Study Variables

The choice of dependent and independent variables was measured and based on previous studies, data collection sources, and expected relationships, as shown in Table 2.

Table 2
Description of the variables to be used in the research

Variable	Description	Previous studies	Source and data collection	Expected relationship
ESG	**Dependent variable measured through the index from 0 to 100** – With the highest indicator for firms with environmental, social, and governance practices and 0 for firms without levels of environmental, social, and governance practices and/or without ESG score assessment in the Refinitiv® database. The ESG index is assessed by the Refinitiv® Database by weights of 10 categories (issuance, innovation, and use of resources in the environmental factor; human rights, responsibility for the product, workers, and community in the social factor; and management, stockholders and Corporate Social Responsibility strategy in the governance factor).	Naciti (2019); Azmi et al. (2021); Murè et al. (2021); Mohammad and Wasiuzzaman (2021)	Thomson Reuters Eikon	Not applicable
FIRM.SIZ.	**Independent Control Variable (numerical) -** Firm size, which will be measured by the logarithm of the total assets of the banking firms.	Murè et al. (2021)	Thomson Reuters Eikon	Positive
ROA	**Independent Control Variable (numerical) -** Return on Assets, which will be calculated by the ratio of operating revenue/total assets of banking firms.	Azmi et al. (2021) and Mohammad and Wasiuzzaman (2021)	Thomson Reuters Eikon	Positive
ADR	**Independent Variable (dummy) -** Banks with trading of *American Depositary Receipts* (ADRs) in the USA, which will be measured 1 for banks with ADR issuance and 0 for banks without ADR issuance.	-	[B]³	Positive
LOG. CRED. OPER.	**Independent Variable (numerical) - logarithm of the sum** of credit operations released by banks in the short and long term	-	Thomson Reuters Eikon	Positive
CAP. STR.	**Independent Variable (numerical) –** Capital structure of banks, which will be calculated as a ratio of total debt/total assets of banks.	Mcguire et al. (1988); Champagne et al. (2021)	Thomson Reuters Eikon	Negative
GEN. DIV.	**Independent Variable (numerical)** - Gender Diversity of Board Members, which will be calculated by the ratio between the number of female members and the total number of members in the Board of Directors.	Zhang et al. (2012); Naciti (2019)	Reference Form, on the [B]³ website	Positive
IND. MEM.	**Independent Variable (numerical)** - Independent members of the Board of Directors, which will be measured by the ratio of the number of independent members to the total members of the Board of Directors.	Hussain et al. (2018); Naciti (2019)	Reference Form, on the [B]³ website	Positive
B.I.	**Independent Variable (dummy) -** Board Interlocking, which will assess the maintenance of the presence of members of the Board of Directors (BoD) among banking firms, which will be measured 1 for banks that present members of the BoD who are common between banking institutions and 0 for banks that do not present members of the BoD who are common between banking institutions.	Barros (2017); Ribeiro (2019	Reference Form, on the [B]³ website	Positive

Source: Research data (2023).

For the exposed variables, the data were collected and structured from the descriptive statistics of each component and analyzed through censored *TOBIT* regression due to the dependent variable of the study being an index ranging from 0 to 100. The Refinitiv® database estimates this score. As the scope limitation of many banks was classified as 0 due to non-estimation of the database, this effect was controlled in the study.

As for the independent variable of Board Interlocking (B.I.), its use in the study is justified because this practice applies only to the segment of financial institutions as a result of the sector presenting technical specifications such as the Accounting Plan (COSIF) of Institutions Regulated by the Central Bank of Brazil (BCB), according to CMN Resolution No. 4.858, of October 23, 2020, and BCB Resolution No. 92, of May 6, 2021. Its applications in management derive from the quality of its managers, whose exercise of the member results from the approval of the names by the BCB regulatory body with proven technical qualifications and applied in the financial sector in previous performances, according to CMN Resolution No. 3.041, of November 28, 2002, and its consequences.

Such circumstances show that, regardless of the exercise of the board of directors in other firms, the member of the bank's board of directors carries technical knowledge of the sector if he has worked in other financial institutions regulated by the BCB and if the regulatory body approves their name for professional practice in banks. This justifies, for the research, the non-use of Board Interlocking practices between some financial institutions and the other firms of the Brazilian stock exchange, due to the board members, in these cases, not conducting practices inherent to the sector studied in this research.

3.3 Data analysis

In search of the proposed objectives and the methodological epistemology of the study, we used the descriptive statistical analysis of the variables and the *Tobit* Regression model, which was used in the study because the dependent variable, the ESG index, is concentrated between ranges of values (range from 0 to 100). This model is the most appropriate to solve this problem, as it uses statistical techniques that enable inferences for the entire population without losing quality. The *Tobit* model is an extension of the *Probit* and *Logit* models. The model applies to a censored sample with the response variable available for some observations and censored in a range known as censored regression.

The model used in the study is a maximum likelihood regression (MLR), called the Censored or *Tobit* Model, which uses a dependent variable with a known and truncated distribution (Wooldridge, 2016; Gujarati & Porter, 2011). The MLR aims to find the values of the parameters that maximize the likelihood function, and these parameters are used to estimate the relationship between the dependent and independent variables.

Thus, the *Tobit* regression model allowed us to estimate the best effects of several variables of the Board of Directors on the event of "ESG best practices" (100) or without levels of ESG practices and/or without ESG score assessment by the Refinitiv® database (0), according to the Refinitiv® database assessment index. According to Wooldrigde (2016), the estimation of this model is made through the maximum likelihood method.

Thus, the maximum likelihood estimates of the *Tobit* model were obtained by maximizing likelihood with respect to the parameter vector β (Eq. 1). The expected value of the observed variable y and xk is given by Eq. 2.

$$\beta \, k = \partial E \, (y|x) \, / \, \partial xk (1)$$

$$\partial E \, (y|x) \, / \, \partial xk = \emptyset \, (x\beta/\sigma) \, \beta k (2)$$

According to the literature and theories assessed, we sought to analyze the correspondence of eight independent variables in relation to ESG practices, being proposed to perform the empirical tests

of the research hypotheses H_1, H_2, H_3, H_4a, H_4b, H_4c, H_4d, and H_4e), the econometric modeling available in the model (3):

$$ESG(x) = \beta 0 + \beta 1 TAM.EMP. + \beta 2 ROA + \beta 3 ADR + \beta 4 LOGOPER.CRED. + \beta 5\ EST.CAP. + \beta 6 DIV.GEN. + \beta 7 CONS.IND. + \beta 8 B.I. + \varepsilon \quad (3)$$

The variables are firm size (FIRM SIZ.), Return on Assets (ROA), issuance of *American Depositary Receive* (ADRs), Log. of credit operations (LOG.CRED.OPER.), and Capital structure (CAP.STR.), the variables of characterization of banking institutions; gender diversity of members (GEN.DIV.), independent members (IND.MEM.), and Board Interlocking (B.I.), the variables that capture the forms of composition of the Boards of Directors.

4 RESULTS

4.1 Descriptive statistics

This section presents descriptive statistics, frequency distribution, and analysis diagrams as a result. Table 3 presents the descriptive statistics of the research variables: mean, median, standard deviation, minimum and maximum values, and the coefficient of variation.

Table 3
Descriptive statistics of dependent and independent variables

Variable	Mean	Median	Standard Deviation	Minimum	Maximum	Coefficient of variation	Observations
ESG Index	9.23	0.00	15.24	0	91.72	1.65	178
CAP. STRU	0.79	0.90	0.27	0.01	0.95	0.73	178
FIRM SIZ.	7.44	7.29	0.98	4.88	9.32	0.98	178
ROA	0.29	0.28	0.16	0	0.85	0.02	178
CRE.OPE.	6.45	6.81	2.23	0	8.85	4.99	178
ADR	0.18	0.00	0.38	0	1	0.15	178
GEN.DIV.	0.09	0.00	0.12	0	0.5	0.02	178
IND.MEM.	0.17	0.17	0.17	0	1	0.03	178
B.I.	0.51	1.00	0.50	0	1	0.25	178

Source: Research data (2023).

Regarding the variables of characterization of banking institutions, the following stand out: 1) regarding the capital structure of banks, total debts have a mean of 0.79 in relation to their assets; 2) regarding the variables size of banks and the ROA, there is a reasonableness among institutions with a low coefficient of variation; 3) on the other hand, credit operations present variability among banks because they have institutions in the corporate structure of Holdings, which due to the legal nature do not release credits to customers; and 4) regarding the issuance of stocks in the American market (ADRs), it is noticed that only 18% of the annual observations of Brazilian banks carry out negotiations of their stocks on American exchanges.

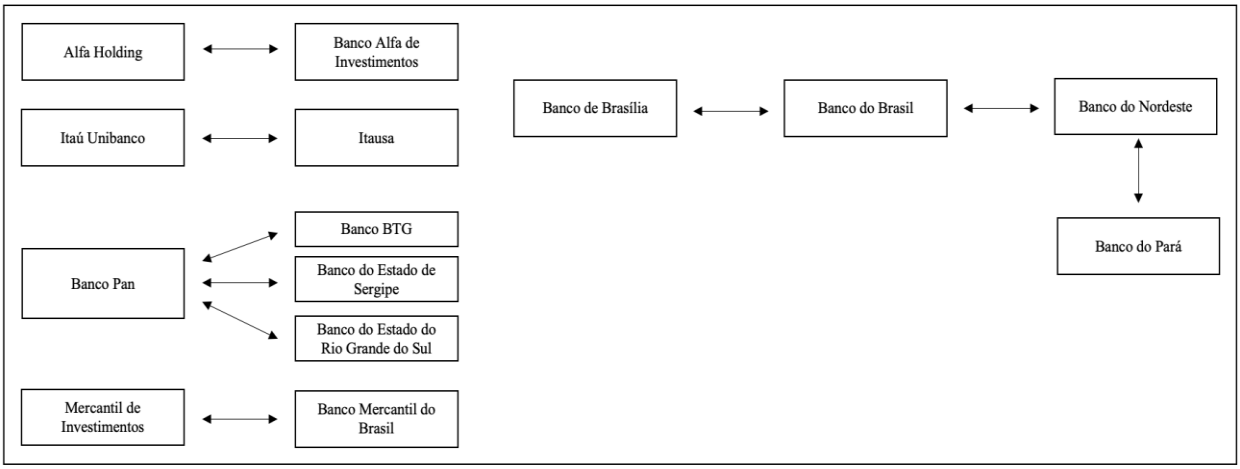
Regarding the characterization variables of the Boards of Directors of the banks, it is clear that, for the observations verified, the highest percentage of a Board of Directors with a female presence reached 50% in the total number of board members, with 9% being the mean value of the participation of women compared to the total number of board members, which demonstrates that there is still low female participation in the top corporate management of Brazilian banking institutions. For the variable, independent members in the Board of Directors, there is a low incidence of these independent members, with about 17% of the observed members being independent of the majority stockholder of the banks.

Also, for the practices of B.I., it is verified in the Boards of Directors of the banks, given the 178 observations assessed, a frequency of 86 annual observations with sharing of administrative members between the top management bodies of the banks, drawing attention to the institutions Banco do Brasil, Alfa Holding, Banco Alfa de Investimentos, Itaú Unibanco, Itausa, Banco Pan, Mercantil de Investimentos, and Banco Mercantil do Brasil, with 3 or more shared members, followed by the banks Banco de Brasília, Banco do Nordeste, Banco do Pará, and BTG, these being intermediaries in practices of B.I., and finally, the banks Banco do Estado de Sergipe and Banco do Estado do Rio Grande do Sul, with the lowest incidence of B.I., with only one member shared between the boards.

Figure 1, in a schematic format, shows the connections of members in common of the Boards of Directors (BoD) between Brazilian banks, characterization of the networks of connections of the Boards of Directors and B.I. practices:

Figure 1

Board Interlocking (B.I.) practices among Brazilian financial institutions



Source: Research data (2023).

From Figure 1, it is assessed that the links between the members of the Boards of Directors of Brazilian banks are mostly justified by the links of the corporate structures of some economic conglomerates or banks, whose majority stockholders are the states or the Federal Government. It can be seen that, of the total of 14 institutions with Board Interlocking practices, 9 institutions (Banco de Brasília, Banco do Nordeste, Banco do Pará, Banco Pan, Banco do Estado de Sergipe, Mercantil de Investimentos, Banco Mercantil do Brasil, Alfa Holding, and Banco Alfa de Investimentos) do not present levels of ESG practice scores attributed by Refinitiv®, demonstrating the inversion of proportionality between the variables.

Regarding the ESG practices with a score, of the 178 observations of the banks, only 31 presented institutions with environmental, social, and governance practices, demonstrating an index of 17% of the annual observations of banks with ESG practices, attributed by the Refinitiv® score. Brazilian banking institutions with the best ESG practices stand out, with a greater frequency of annual observations from 2013 to 2020, as shown in Table 4.

Table 4

Frequency distribution of the ESG (dependent) variable

Banks	Number of annual observations in Thomson Reuters ESG Score	Years in Thomson Reuters ESG Score
Itausa	8	(2013 to 2020)
Santander Brasil	7	(2013, 2014, 2015, 2016, 2017, 2018, 2020)
Banco do Brasil	3	(2013, 2017, 2020)
BTG Pactual	3	(2018, 2019, 2020)

Itaú Unibanco	3	(2018, 2019, 2020)
Banco ABC Brasil	2	(2019, 2020)
Banco Inter	2	(2019, 2020)
Banco do Estado do Rio Grande do Sul	2	(2019, 2020)
Banco Bradesco	1	(2020)
Total	31	

Source: Research data (2023).

It is observed that, due to the frequency presented, Brazilian banks have started to adopt ESG practices more recently and, from a sample of 24 banks assessed, only 9 institutions, about 37.5% of the total, are carrying out corporate social responsibility activities, seeking improvements in operations with sustainable, social, and governance applications.

Figure 2

Word cloud elaborated in the R software with the intensity of the mean ESG scores of the Brazilian banks listed in [B]³

Source: Research data (2023).

According to Figure 2, from the banks' word cloud, due to the intensity of their mean ESG scores, it was noticed that only 9 of the 24 banks studied have better ESG adoption practices, with emphasis on the banks: Santander S.A., with a mean score of 74.19; followed by Itausa S.A., with a mean score of 47.37; Itaú Unibanco, with a mean score of 29.21; and Banco do Brasil, with a mean score of 22.2 for the adoption of ESG practices.

The other banks have lower levels of adoption of ESG practices, which shows that the practices are only adopted by larger banks and mostly private capital, except Banco do Brasil, as a result of the assessments conducted by the Refinitiv® database in its ESG score.

It should be noted that Refinitiv® does not measure the ESG practices of all firms for cost-benefit reasons. Thus, its policy is to gradually expand the number of firms monitored, prioritizing larger companies belonging to the stock exchange's main index (Ibovespa in the case of Brazil).

4.2 Results of the Statistical Approach

In this section, the *Tobit* Regression is presented, in order to assess which variables influence the adoption of ESG practices in 24 financial institutions, with the ESG score assessed by the Refinitiv® database, ranging from zero (0) to one hundred (100), with zero (0) for banks without an assessment and/or without ESG levels and one hundred (100) for banks with better ESG levels, considering the period from 2013 to 2020, with all results applied and estimated under these conditions, *ceteris paribus*.

Thus, the interpretations of the results are equated to the conditions and limitations of the Refinitiv® ESG score measurement data, which has already been used in other studies, such as

those by Peyerl et al. (2022) and Dandaro and Lima (2022), which is one of the main ESG indices available on the world market.

Table 5
Tobit regression (Censored 0 to 100 dependent variable – ESG score)

ESG	Coefficient	P > |Z|
FIRM SIZ.	83.88448	0.001***
ROA	- 151.9528	0.161
GEN.DIV.	131.3788	0.039**
IND.MEM.	- 125.892	0.041**
B.I.	- 35.07192	0.055*
ADR	- 73.08342	0.086*
LOG.OPER. CRED.	8.158705	0.742
STR. CAP.	- 162.4126	0.337
_CONS	- 537.2315	0.006
LR Chic2		**91.77**
Prob > Chic2		**0.00**
Pseudo R²		**0.1965**
Observations		**178**
Log-likelihood		**-187.62848**

Note. ***significant at 1%; **significant at 5%; *significant at 10%
Source: Research data (2023).

Table 5 shows that the chi-square value (*LR Chic2*) is 91.77. This indicates that the coefficients are, together, significant to explain the adoption of good ESG practices by banking institutions. *Prob>Chic2* = 0.00 indicates that one can reject, at all levels of significance, the hypothesis that all coefficients are equal to zero, preliminarily indicating that there is at least one significant coefficient value.

Also, *Pseudo R²* reports that approximately 20% of the variation of the dependent variable is explained by the model variables, which reveals a good percentage of explanation. Moreover, the *Log-likelihood* indicates the adequacy of the logistic model due to its negative value (-187.63) because, according to Minussi et al. (2002), the lower its value, the better the model's fit in predicting parameters.

Analyzing the coefficients individually, it is initially verified that the characteristics of the banks, Firm Size (Bank), and ADR (*American Depositary Receive*) are significant for the model in the predictive ability to corroborate with the best ESG practices for Brazilian banking institutions at a level of 1% and 10%, respectively, with the size being positively significant and the ADR, negatively significant, indicating that larger banking institutions conduct ESG mechanisms, but tend not to issue ADRs. The estimated results follow the study by Murè et al. (2021), which visualized that larger Italian banking institutions have better levels of ESG practices.

As for ADRs, it is indicated that Brazilian banks that issue stocks for trading in the US market through ADRs did not present better levels of ESG, as opposed to what was estimated of banks with stocks traded outside the country, which would have better indications of ESG. Regarding the characteristic of the capital structure of banking institutions, the study's finding shows that firms with higher indebtedness have a lower level of ESG practices, corroborating previous research by Mcguire et al. (1988) and Champagne et al. (2021).

However, it was found that the variables related to the characteristics of the institutions, capital structure, and Return on Assets (ROA) are negatively related, but are not significant to explain the adoption of ESG practices. The variable of credit operations is positively related to firms' ESG practices. Still, it does not have a degree of statistical significance, indicating that some banking institutions that adopt them may have lower Returns on Assets (ROAs) and/or indebtedness, but higher credit operations. Thus, the results found before the variable "ROA"

contradict the findings of previous research conducted by Azmi et al. (2021) and Mohammad and Wasiuzzaman (2021), whose findings showed that more profitable banks have better sustainability indicators. This result is certainly due to the larger volume of assets of banks whose increase in their size presents better ESG levels, denominators, and reducers of ROA.

Regarding the composition aspects of the Board, the variables 'women on the Board of Directors' (GEN.DIV.) and 'Independent Members on the Board of Directors' (IND.MEM.) explain in a statistically significant way, at a significance level of 5%, the adoption of ESG practices. With regard to the variable Board Interlocking (B.I.), which determines the board members in common among the Boards of Directors of Brazilian banking institutions, it presented a significance of 10% for the model in the predictive ability to corroborate with ESG best practices for Brazilian banking institutions.

However, the variable GEN. DIV. presented a positive coefficient and B.I. and IND.MEM., with negative coefficients; which indicates that firms with ESG practices have a majority of women on the Board of Directors, but fewer independent members and Board Interlocking practices. Furthermore, the study by Zhang et al. (2012) corroborated these findings since these researchers demonstrated that having more women on the Board of Directors efficiently achieves better sustainable performance.

Besides, regarding the variables of the characteristics of the Boards of Directors, number of independent members, and Board Interlocking practices, the results of this study disagree with the positive expected estimates and with the previous research by Hussain et al. (2018), Naciti (2019), Barros (2017), and Ribeiro (2019). Therefore, with the appropriate proportions and methodological precautions, due to the limitations of the study sample, it is noteworthy that the variables of characteristics of the firms, ADR of banking institutions, as well as the variables of characteristics of the Boards of Directors, independent members, and Board Interlocking practices, presented a negative relationship with the adoption of ESG practices by banking institutions, and hypotheses H2, H3, and $H4_c$ were rejected.

Also, the variable on organizational characteristics, credit operations, even presenting the relationship established in hypothesis $H4_d$, was not significant to explain the adoption of ESG practices by firms, therefore being rejected. The variables Return on Assets (ROA) and capital structure, in addition to presenting an opposite relationship to hypotheses $H4_b$ and $H4_e$, respectively, were also not statistically significant, and are therefore rejected. Finally, there was a positive and significant relationship between the gender diversity of board members and the size of banks with the adoption of ESG practices by banking institutions, with H1 and $H4_a$ not being rejected.

5 FINAL REMARKS

This study aimed to analyze whether the corporate governance characteristics of the Board of Directors, the capital structure, and the economic and financial performance of the firms influence the adoption of ESG practices by banking institutions listed in $[B]^3$. The annual data from 2013 to 2020 of 24 banking institutions listed in $[B]^3$ were analyzed, totaling 178 annual observations. Descriptive statistical procedures were performed to meet this objective and the *Tobit* regression model was estimated.

The study aimed to contribute to the advancement of ESG studies applied to the context of banking financial institutions listed in $[B]^3$, in line with international literature and market standards applied to financial institutions. As with previous national research, such as those by: Santos et al. (2022), Dandaro and Lima (2022), Guimarães and Malaquias (2022), Macedo et al. (2022), Peyerl et al. (2022), and Silva Júnior et al. (2022), who assessed corporate social responsibility, sustainability, and ESG for financial market firms and specific stock funds, except in these studies the verifications of financial institutions listed in Brasil, Bolsa, Balcão ($[B]^3$).

Thus, it is evident that the current research has become a pioneer in Brazil regarding assessing financial institutions and environmental, social, and corporate governance practices.

It is verified that, from the sample of 24 banks assessed, only 9 institutions, about 37.5%, have corporate social responsibility activities, seeking improvements in operations with sustainable, social, and corporate governance applications, which evidences the search for corporate social responsibility practices in a still incipient way by Brazilian banks.

For the practices of Board Interlocking (B.I.), it is verified in the Boards of Directors of the banks, given the 178 observations obtained over the period studied, a frequency of 86 annual observations of management boards with sharing between the top management bodies of the banks, being high the number of people positioned in common between the banks in the corporate top management. It is believed that this result results from the sharing between the corporate structure of some financial and economic conglomerates or banks whose majority stockholders are the states or the Federal Government, as well as from the expertise that the members conduct in the exercise of their management in financial institutions, following CMN Resolution No. 3,041, of November 28, 2002, and its consequences, which provides for the approval of the members by the BCB's regulatory body.

Concerning the significance of the characteristic variables of the firms, it is verified that the Firm Size (Bank) and *American Depositary Receive* (ADR) present statistical significance for the model in the predictive ability to corroborate with ESG best practices for Brazilian banking institutions at a level of 1% and 10%, respectively, with firm size with a positive relationship and issuance of ADRs with a negative relationship to determine the probability of the event of ESG best practices occurring in banks.

The implications of these findings show that larger banks are more adherent to socio-environmental, sustainability, and ESG policies, following the regulatory agent and the CMN 4,327 standard of 2014, as a result of having considerable sizes for the banking market with assets that correspond to or exceed about 10% of the country's Gross Domestic Product (GDP) or carry out a relevant international activity, regardless of the size of the institution. Thus, these large banks and/or international relevance have a higher level of requirement and supervision by regulators, following CMN Resolution No. 4,557 of 2017, as they fit as banks in the large-scale S1 segment.

As for the corporate governance characteristics applied to the Board of Directors, the variables women on the Board of Directors (GEN.DIV.) and Board Interlocking (B.I.) are significant for the model in the predictive ability to corroborate with the best ESG practices for Brazilian banking institutions at a level of 5% and 10%, respectively, with gender diversity with a positive relationship and B.I. with a negative relationship to determine the best rates of "ESG practices" occurring in banks.

It was noticed that some banking institutions present more women on the boards of directors, even without any rule requiring the participation of women in equal numbers to men on the Boards of Directors. Banking institutions with greater gender diversity adhere to ESG best practices because they have higher rates in their management. The finding highlights the need to mature regulatory policies that maximize female participation in the top management of banking and non-banking firms, aiming to improve social and environmental responsibility practices in the business market.

The characteristics of the institutions, size, and gender diversity are positively related to the occurrences of best practices and ESG levels of the institutions, corroborating the previous and foreign literature of Murè et al. (2021), Zhang et al. (2012) and Naciti (2019). For the characteristics of issuing ADRs and Board Interlocking practices between banks, both are negatively related to the occurrences of best practices and ESG levels of the institutions, showing that the participation between board members between banks and the issuance of ADRs of banks for trading stocks in the American market minimizes the ESG practices of Brazilian banking institutions.

It should be noted that although some characteristics of the firms and the Board of Directors corroborate and do not corroborate the hypotheses defended, these findings contribute to the literature and the market. For academia, the contributions are applied to the fact that this work empirically analyzes the emerging and little explored relationships in the literature by inserting new characteristics assessed in the context of the Brazilian market for financial institutions. Furthermore, for the market, the contributions of the study are in the fact that banks are addressed, which are in better compliance with the resolutions of the Central Bank of Brazil in their socio-environmental activities and are adapting to the demands of stakeholders for better sustainable institutions to invest, based on Stakeholder Theory. In addition to improving banks' institutional and legitimate reputation, the research contributes to the characteristics of Boards of Directors and firms that impact the best ESG levels following Agency Theory.

As for the study limitations, it is noteworthy that the results cannot be generalized, and they are restricted only to the 24 banks, applied to the estimates of the Refinitiv® ESG score and the analyzed period from 2013 to 2020. The limitation of the statistical inferences of this study stems from the low number of banks listed in B3, and this group is the object of the research. Although there is a statistical limitation regarding the findings and inferences found, the study was justified by assessing the banking sector, given the relevance to the country's economy that these institutions represent, as they structure the country's financial credit system interconnecting surplus and deficit agents economically.

Also, of the 6 (six) largest banks in Brazil classified in the S1 segment of the Central Bank of Brazil (Bacen), according to CMN Resolution No. 4,553 of 2017 and Bacen data, the study verified 5 (five) of these institutions, namely: BTG Pactual, Bradesco, Banco do Brasil, Itaú, and Santander, which each represent the size equal to or greater than 10% (ten percent) of the country's Gross Domestic Product (GDP), or exercise relevant international activity, regardless of the size of the institution, except Caixa Econômica Federal (CEF). Thus, this verification of the CEF is suggested in future research.

Thus, as a suggestion for future research, the importance of expanding this approach is also highlighted, based on the insertion of new variables for the characterization of the Boards of Directors and banking firms, in order to assess whether they will be significant to estimate firms' ESG best practices.

Moreover, it is suggested to analyze other segments of firms listed or not in the Brazilian capital market and other countries, creating its own ESG estimator for the firms. Thus, as a suggestion for future studies, we recommend continuing the research with application to all banks listed and not listed in $[B]^3$ to assess the effect of larger and smaller-scale banks on their levels of ESG applied.

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