LUMEN ET VIRTUS
ISSN: 2177-2789

ANALYSIS OF ECONOMIC AND FINANCIAL INDICATORS FROM THE PERSPECTIVE OF SUSTAINABILITY: A STUDY WITH COMPANIES IN THE ENERGY SECTOR LISTED ON B3

https://doi.org/10.56238/levv15n42-009

Submitted on: 01/10/2024 **Publication date:** 01/11/2024

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ABSTRACT

The global demand for electricity is continuously growing. Therefore, the analysis of the companies involved becomes timely. This study investigates the impact of the disclosure of sustainability reports, with and without audit opinions, on the economic and financial performance of companies listed on B3 during the period from 2019 to 2023. Methodologically, the research has a descriptive approach, documentary procedure and quantitative nature. Its temporal dimension is longitudinal. The sample, composed of 77 companies selected probabilistically, was divided into: 47 companies that published reports with an audit opinion, 12 that disclosed without an opinion, and 18 that did not publish reports. Through the Kruskal-Wallis test, the results indicated that companies have similar performances in metrics such as current liquidity, dry liquidity, overall liquidity, net margin, and asset turnover. However, statistically significant differences were observed in the quick ratio, in the indebtedness ratios (grade and composition), as well as in the indicators of return on investments (ROI) and return on equity (ROE). This study contributes to the literature by providing insights into how the disclosure of sustainability reports can influence various aspects of the financial management of electric power companies.

Keywords: Sustainability report, Economic and financial performance, Economic and financial indicators.

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INTRODUCTION

The energy industry sector plays a key role in the economic and social development of any country. With the growing concern for sustainability and the search for renewable energy sources, the energy sector is undergoing a significant transformation. In this dynamic context, understanding the financial health of companies operating in this segment is of paramount importance for investors, managers, and other stakeholders.

Brazil has one of the largest hydrographic networks in the world, which gives it a significant potential for generating electricity. The relevance and size of hydroelectric plants in Brazil are seen in the fact that three of the ten largest hydroelectric plants in the world are located in the country, standing out as its main source of energy (Engie, 2022).

The construction of hydroelectric power plants has significant impacts on the environment (Custódio et al., 2022; Obeso et al., 2024). However, such plants play a fundamental role for the economic system, since they represent an important source of energy and, currently, such companies are pursuing the energy transition to less impactful sources, being responsible for supplying energy and generating thousands of jobs globally (Farghali et al., 2023).

Fundamentally due to the importance that the electricity sector plays in Brazil, there is a strategic impact on economic and social development, since this branch of the economy directly influences the ability to meet the needs of the Brazilian population, generating well-being and quality of life (Chaves; Giusti; Strauch, 2021).

According to the International Financial Reporting Standards Foundation (2021) and B3 (2024), the demand for responsible investments aligned with sustainability criteria is a growing reality. Investment decisions are considering not only the traditional parameters of valuation and profitability, but also new trends related to environmental issues. Investors prioritize investing their resources in socially responsible, sustainable and profitable companies, because these companies, by demonstrating good practices in these areas, generate value for shareholders in the long term and demonstrate more preparation to face economic, social and environmental risks.

In this context, the following problem arises: What is the relationship between the disclosure of sustainability reports, accompanied or not by audit opinions, and the economic and financial performance of publicly traded electricity companies?

In view of the growing importance of sustainability in global financial markets, especially in the electricity sector, this study aims to investigate how the disclosure of sustainability reports, accompanied or not by audit opinions, influences the economic and financial performance of publicly traded companies. To achieve this objective, publicly

traded companies in the energy sector will be selected, whose financial statements for the years 2019 to 2023 are available.

Specific objectives include: verifying which publicly traded companies in the electric power sector publish sustainability reports on their websites; assess the presence of audit opinions in these reports; compare the economic and financial indicators of companies that disclose sustainability reports with those that do not.

This study seeks to provide evidence on how transparency and sustainable practices influence the valuation and attractiveness of companies in the market. The justification for its realization lies in deepening the understanding of the economic and financial performance of companies in the energy sector, offering important indications for stakeholders interested in the performance of this market for the national economy.

In addition, it examines whether companies that publish sustainability reports have superior economic and financial performance or if they adopt this practice only to align with market trends.

The article is structured as follows: in the following section, the theoretical framework is presented, addressing the main concepts related to financial analysis and financial statements. Then, the methodology used for data collection and analysis will be described. Subsequently, the results obtained are presented. Finally, the final considerations of the study follow, along with suggestions for future research.

THEORETICAL FRAMEWORK

ENERGY SEGMENT IN BRAZIL

According to the National Bank for Economic and Social Development (2021), the electricity sector has undergone profound transformations globally in recent years. The search for decarbonization and neutrality of greenhouse gas (GHG) emissions has driven the energy transition to a low-carbon economy.

These changes in the industry bring both challenges and opportunities. The energy transition, combined with the advancement of new technologies, is reconfiguring the way energy is generated. Brazil's position as a leader in this process requires a legal and regulatory framework that encourages a favorable business environment. To achieve this objective, it is essential to establish rules that provide economic and political constraints to attract investments and promote the generation of jobs and income (Pinto; Dutra, 2022).

To ensure the expansion of the system in a reliable and sustainable way, it is essential to preserve the financing capacity. This means that banks and the capital market must continue to believe that projects in the electricity sector will be able to meet their

financial commitments and provide a return on invested capital, thus enabling their continuity (Brasil, 2019).

The regulatory institutions that oversee this segment include the National Electric Energy Agency (ANEEL), Ministry of Mines and Energy (MME), National Energy Policy Council (CNPE), Electric Sector Monitoring Committee (CMSE) and the Electric Energy Trading Chamber (CCEE), which demonstrates strong control over the sector. In order to improve the services offered by the concessionaires, there is an intense performance in economic and financial inspection, energy generation and electricity services throughout the country. As a result, reports on distributors' economic and financial sustainability indicators are produced, which consolidate the financial information of these companies (Cabral et al., 2022).

SUSTAINABILITY REPORTING AND INDEPENDENT AUDITING

Considering historical and contextual aspects at a global level, it is worth mentioning in this topic some sustainability reporting practices that deserve to be highlighted, since reporting to stakeholders the information regarding what the company does for the environment and society expresses a corporate and ethical socio-environmental commitment.

Internal pressures in corporations other than those arising from stakeholders contribute to the implementation of ESG-type conducts, which stands for Environmental, Social and Governance. These practices, when effectively planned and executed, promote the reputation of companies positively (Oliveira; Sellitto; Flores, 2022).

In this sense, corporate attitudes must consider the environmental impacts caused by corporate actions, better known in the scientific field as anthropic actions (Queiroz et al., 2021). In the fight against human actions, socio-environmental accounting and environmental management play a crucial role, helping companies to act responsibly in their operational processes (Bandeira; Ott; Rover, 2022).

Companies in the electricity sector cause social and environmental impact, making actions for environmental preservation and the voluntary disclosure of transparent information to stakeholders meaningful. This disclosure occurs through sustainability reports, predominantly for companies listed on B3, following the guidelines of the Global Reporting Initiative (GRI), which require a detailed description, both quantitative and qualitative, of socio-environmental risks and impacts (Fraga et al., 2021).

The dissemination of these reports is not limited to satisfying only the needs of the users of the information or the interests of the managers, bringing significant benefits such

as social legitimacy and the construction of a positive image. The global standards of these reports allow companies to publicly disclose the economic, environmental, and social impacts of their operations, providing transparency on how they manage these risks and contribute to sustainable development (Bandeira; Ott; Rover, 2022).

Sustainability reporting offers benefits that minimize financial risks by improving companies' environmental, social, and governance performance. Disclosing sustainability information differentiates companies in a competitive market, increasing investor confidence, employee loyalty, and transparency of operations (Melo; Barbosa, 2023).

According to Borges et al. (2021), the specific objective of a sustainability report is to communicate the results of prioritized international initiatives, influencing the strategy and allocation of resources by the company's top management. In addition, the report highlights the actions taken to mitigate the impacts of climate change, with the aim of preventing financial crises.

Sustainability reporting is essential for organizations to be able to communicate their sustainability efforts and commitments in a transparent and responsible manner. External auditing of these reports is critical to ensure the integrity and accuracy of the information disclosed, ensuring that environmental, social, and financial data complies with relevant norms and standards. In addition, external audits increase the confidence of stakeholders, such as investors and consumers, by demonstrating a clear commitment to responsibility and sustainability (Anjos, 2023).

Therefore, organizations increase the credibility of their social and environmental reports, meeting the informational needs of stakeholders and maximizing their economic, financial, and non-financial returns (Luna, 2019). Thus, in analyzing financial statements, investors will consider not only financial data but also environmental practices and transparency of sustainability reporting.

ANALYSIS OF FINANCIAL STATEMENTS

The analysis of financial statements is essential for strategic planning and decision-making within organizations. This analysis is done through economic-financial ratios calculated from the published financial statements (Peris, 2016). These indicators are used to assess the company's situation and may include the correlation with the return of shares traded on the stock exchange (Flach; Matos, 2020).

Financial statements are a set of accounting information that exposes the company's financial and economic situation, helping to determine if the company is able to pay its debts, if it is profitable, and if it will continue to invest in the market. This information is

useful for stakeholders to evaluate companies before granting credit, providing a clear view of the organization's financial condition (Silva et al., 2024).

In addition, the analysis and monitoring of economic and financial data help to direct the investment and financing decisions made by the management. The analysis of financial statements offers important information on liquidity, indebtedness, and profitability, supporting the definition of future strategies (Zucco, 2023).

The analysis of financial statements is a fundamental instrument for all stakeholders in the organization, whether internal or external agents, who seek to convert raw accounting data into information that reveals trends, financial health, management quality, and the sustainability of the business (Santos, 2023). Assaf Neto (2020) emphasizes that the analysis of balance sheets provides crucial information that impacts decision-making, such as the granting of credit, investments in equity, adjustments to financial policies, evaluation of management efficiency, and determination of payment capacity.

Economic and financial analysis comes from the interpretation of financial statements, allowing the identification of a company's financial "health" and determining strategies for managing resources, achieving favorable results and ensuring business continuity (Regert et al., 2018).

In addition, the analysis of financial statements involves everything from the interpretation of numerical aspects and calculation of indicators to a comprehensive evaluation, aiming to extract information relevant to the objectives of stakeholders. It is essential to consider all the agents involved, such as managers and auditors, and to examine the history of disclosures in the financial statements, both in form and content (Silva et al., 2024).

The economic and financial indicators are categorized into four main areas: capital structure, liquidity, profitability and activity. For this study, indicators of capital structure, liquidity and profitability were selected, including the participation of third-party capital, debt composition, net equity immobilization and immobilization of non-current resources (Vargas; Atamanczuk; Pienegonda, 2020).

ECONOMIC AND FINANCIAL INDICES

Financial analysis by quotients is one of the major advancements in the field of accounting, and the essence of balance sheet analysis lies in the use of quotients to evaluate corporate financial performance. These quotients establish connections between items and groups of values found both in the balance sheet and in the income statement.

From these indicators, it is possible to obtain a solid understanding of its internal functioning and an assessment of its stability and profitability (Iudícibus, 2017).

According to Marion (2019), indices represent relationships established between two quantities, facilitating the analyst's work, as the analysis of certain proportions or percentages is more significant and relevant than simply observing absolute values.

This analysis is essentially comparative, and the evaluation of a single index does not provide sufficient information for a diagnosis. Therefore, it is essential to understand the evolution of the index over the years and compare it with the performance of competitors and market patterns to achieve a broad perspective (Assaf Neto, 2020).

Liquidity Ratios

For Marion (2019), liquidity indicators provide information for managers and investors, making it possible to assess the company's ability to honor its liabilities and its ability to convert assets into cash. These liquidity ratios are used to measure the company's ability to pay, and that this assessment can be made considering different long-term, short-term, or immediate term perspectives. The liquidity indicators are current liquidity, dry liquidity, quick liquidity, and general liquidity.

The current ratio indicates the amount of short-term resources that the company has for each dollar of short-term obligations. The higher the current liquidity, the greater the company's ability to finance its working capital needs. In other words, higher results are more favorable (Assaf Neto, 2020).

Iudícibus (2017) observes that the current ratio is recognized as one of the best liquidity indicators of a company. However, he warns that when analyzing this index, it is crucial to consider the different maturity periods of accounts receivable and accounts payable. If these deadlines are disregarded, the analysis can become distorted, compromising the accuracy of the evaluation. Therefore, for a more reliable analysis, it is important to complement the use of the current ratio with careful consideration of the terms of assets and liabilities.

The dry liquidity ratio is used to assess a company's ability to pay, especially in cases of low inventory turnover. This indicator is similar to the current ratio, and its interpretation follows the same logic: the higher the value of the index, the better the company's ability to meet its obligations. The difference is that, in the dry liquidity ratio, inventories are excluded from the calculation, which makes it a more accurate tool for evaluating companies with slow-rotating inventories (Silva, 2019).

Bazzi (2020) recommends that, when analyzing the dry liquidity ratio, it is important to compare it with the results of other companies in the same sector in the market. This comparison helps to identify trends in the segment and better understand the company's relative position in terms of liquidity.

The quick ratio indicates what percentage of short-term debt (current liabilities) can be paid off immediately using only cash or cash equivalents (available). It serves to assess the company's ability to meet its short-term financial obligations quickly, without depending on future assets or revenues (Martins; Miranda; Diniz, 2019).

Silva (2019) states that the immediate liquidity ratio is not the most important for liquidity analysis, as companies generally do not keep large amounts in cash, and debts have maturities of up to 360 days. Therefore, this characteristic may limit the effectiveness of the index as a tool to assess financial health in the short term.

The overall liquidity ratio measures the company's ability to pay its obligations in both the short and long term, in relation to all debts assumed. Despite the divergence between conversion and payment terms, an analysis that spans several years can provide richer insights. If a company has a decreasing overall liquidity ratio over several years, even with these term variations, this may indicate a gradual loss of payment capacity in the long term (Marion, 2019).

It is worth closing this topic in question with an important observation. 78% of publications report a positive relationship between corporate sustainability and financial performance (Alshehhi; Nobanee; Khare, 2018). However, there is no consensus on these numbers, since some studies with companies included in the Dow Jones Sustainability Index (DJSI), the liquidity shows initial negative results in parallel with the adoption of sustainable policies; and there is a need for long-term follow-up (Lopez; Garcia; Rodriguez, 2007).

An important observation is in order. 78% of publications report a positive relationship between corporate sustainability and financial performance (Alshehhi; Nobanee; Khare, 2018). However, there is no consensus on these figures, since some studies with companies included in the Dow Jones Sustainability Index (DJSI), liquidity shows initial negative results in parallel with the adoption of sustainable policies; and there is a need for long-term follow-up (Lopez; Garcia; Rodriguez, 2007).

Debt Ratios

Indebtedness indicators allow you to identify whether the company is using more equity capital or third-party capital. However, for an accurate assessment, it is necessary to

analyze these ratios together with other indicators, providing a more comprehensive view of the company's financial situation (Marion, 2019).

According to Silva (2019), indebtedness indicators also have an internal function, indicating the degree of risk associated with financing. Therefore, financial management must monitor debt levels, as many external users use these indicators to assess the strength of the company.

The level of indebtedness reflects the balance between equity and third-party capital. The lower the proportion of third-party capital, the lower the degree of indebtedness; which translates into greater financial freedom for decision-making. If this ratio is less than one, it means that the company has more equity than third-party capital, indicating less dependence on creditors. However, when the index is higher than one, this suggests a greater dependence on third-party capital, leading to restrictions such as high interest rates, short payment terms, and other obligations imposed by creditors (Ribeiro, 2014).

Also for the same author, the debt composition ratio shows the relationship between short-term obligations and the total obligations of the company, indicating how much it will need to pay in the short term for each real of its total obligations. A typical interpretation is that the lower this ratio, the better, since a lower value suggests less pressure to generate resources quickly to cover short-term commitments. Additionally, the analysis of this ratio should focus on determining whether the company will need to mobilize resources in the short term to meet its financial obligations.

Bazzi (2020) states that the shorter the maturity of the debt installments, the greater the financial risk. However, companies that have most of the debt in the long term tend to be in a more favorable situation in the short term.

The assertions of Alshehhi, Nobanee, and Khare (2018) and Lopez, Garcia, and Rodriguez (2007), described above, are directly related to indebtedness; since a financial result considered not ideal in companies included in the Dow Jones Sustainability Index (DJSI), the Dow Jones Sustainability Index, is closely linked to financing for corporate investments for the execution of sustainable policies.

Profitability Ratios

Profitability analysis seeks to calculate the profit rate, comparing profit in absolute values with values related to the business (Marion, 2019). Similarly, Bazzi (2020) defines profitability as an evaluation of the return on investments made and the economic effectiveness of the company. Martins, Miranda, and Diniz (2019) recommend that performance evaluation be done by comparing its results with those of the same sector,

emphasizing the importance of considering the average profitability of the economic segment.

Marion (2019) when comparing profit with assets or profit with equity, observes two aspects to ensure consistency in the calculations. The first is the coherence between numerator and denominator. If the numerator is net income, the denominator should be total assets. If operating profit is used in the numerator, the denominator must be the operating asset. The second aspect is the use of the average value as a denominator. This is because the average of the period better reflects the variation in assets and equity, avoiding distortions that can arise when using only initial or final values of the period.

Profitability analysis evaluates the overall performance of an enterprise, taking into account not only productivity, but also profitability and efficiency in managing total investments. This evaluation includes the return on total investment, return on sales, and return on equity (Silva, 2019).

Ribeiro (2014) states that the profitability index reveals the company's ability to generate profits, showing the value of net income for each dollar invested; higher values are preferable. The calculation of this ratio allows for an accurate assessment of the profit potential, and the closer the ratio gets to 100%, the higher the profits generated. Marion (2019) highlights that profitability is based on investments, and that assets financed by own or third-party capital can generate greater returns with effective management.

The return on equity ratio measures the amount of net income in relation to total invested equity, according to shareholders' equity, as explained by Bazzi (2020). The interpretation of this index is in the sense that the higher, the better.

Two important points about this indicator are highlighted by the authors. Ribeiro (2014) points out that the index indicates what the real gain is from the point of view of the owners, since it uses net equity as the denominator. The second point is that this gain is seen as net income, which means that the higher the ratio, the better for the company.

The Net Operating Margin is also known as the profitability ratio, and is an important indicator of the company's profitability (Martins; Miranda; Diniz, 2019). For Ribeiro (2014), the higher the index, the better, as this suggests greater profitability in relation to sales. However, Silva (2019) warns that there is no ideal index, and recommends that the analyst compare the index obtained with the average of the segment or region where the company operates to obtain a more accurate interpretation.

Bazzi (2020) states that asset turnover shows how many times assets are renewed in relation to sales. Marion (2019) adds that the more revenue is generated, the more efficient the use of assets will be. The interpretation of this indicator is that the higher, the

better; This suggests that the volume of sales made in the period was proportional to the total capital invested. The ideal sales volume is the one that guarantees sufficient profitability to cover all expenses, while still providing a satisfactory profit margin (Ribeiro, 2014).

The congruence of the bibliography with the objectives of this research is essential to be placed here, finally. There are databases in the literature presenting studies that report the existence of a positive relationship between coprorative social responsibility (CSR) and economic performance. Oliveira et al. (2015) conclude research at B3 that there is a positive relationship between the adoption of CSR and the increase in Shareholders' Equity.

METHODOLOGICAL PROCEDURE

This study adopts a descriptive approach in relation to its objectives, characterized by an impartial description of the facts, without interference from the researcher (Newman, 2014; Pradonov; Freitas, 2013).

Regarding the procedures, this research is based on the collection, selection and analysis of documentary sources to achieve the objectives. The documentary research approach focuses on the use of a variety of documents as a source of data, highlighting three aspects that demand the researcher's attention: the careful selection of documents, access to these materials, and subsequent analysis (Lima et al., 2021).

This study is classified as quantitative, using a quantification approach. In this method, it seeks to size, analyze and evaluate the applicability of resources or techniques, introducing variables in data collection for quantitative recording (Newman, 2014; Saccol et al., 2012). It is an objective approach, in which the data are analyzed by statistical techniques and structured in a fixed way in the research, validating scientific knowledge through the results obtained (Rodrigues; Olive tree; Santos, 2022).

Regarding the temporal dimension, the present study adopts a longitudinal approach, which implies that the data were sought in different periods of time. This style of research investigates the relationship between cause and effect during moments or time intervals with certain periods (Hair Jr. et al., 2006; Schneider et al., 2014)

The data collection was based on the financial statements disclosed by the companies, with access made through the portal of the Securities and Exchange Commission (CVM). The sample included companies listed on B3 in the electricity sector, with 77 companies selected.

The study period comprised from 2019 to 2023. With the information collected, economic and financial indicators were calculated, totaling 10 indicators, as shown in Chart 1.

Table 1 – Formulas of the indices analyzed

Category	Indicators	Formula
Liquidity Index	Current Liquidez	Current Assets / Current liabilities
	Dry liquidity	Current Assets - Inventories / Current liabilities
	Liquidez imediata	Cash and cash equivalent / Current liabilities
	General liquidity	Current Assets + Long-Term Realizable / Current Liabilities + Long-Term Liabilities
Debt ratio	Degree of indebtedness	Current Liabilities + Non-Current Liabilities / Equity x 100
	Composition of indebtedness	Circulating Passive / Current Liabilities + Stockholders' Equity x 100
Profitability Ratio	ROI	Liquid Profit / Total assets x100
	ROE	Liquid Profit / Equity x100
	Net Margin	Liquid Profit / Net revenues x100
	Asset turnover	Net revenues / Total assets

Fonte: Adapted from Marion (2019).

Then, based on the information from the Standardized Financial Statements (DFP), the ratios were calculated and organized in spreadsheets with the help of Microsoft Excel. Subsequently, the companies that disclose their Sustainability Report were divided, comparing those that have or do not have a technical audit report. As an analysis technique, a quantitative survey of the economic and financial analysis indices of the last 5 years was carried out.

To calculate the sample size of an unknown population, the free software G*Power 3 was used (Faul et al., 2007). The sampling was probabilistic, for comparison of the mean equal to or greater than 3 independent groups, in this case, the previously defined groups were: RSA, PRS and NRS.

The sample consisted of 77 companies, with variables collected over 5 years. The statistical parameters generated from this sampling were a probability error of 5% and a mean effect size of the f-test of 0.30, resulting in a statistical test power of 0.89. For social research, as recommended by Richardson (2017), it is convenient that the power of the test be equal to or greater than 0.80.

Analysis of variance (ANOVA) was performed, with a test to compare means, using the free software JASP v. 0.18.3.0 (JASP, 2024).

To define the use of parametric or non-parametric tests, the two mandatory assumptions were verified: normality of the data and homoscedasticity of the variances. The test for the purpose of verifying the homoscedasticity of the sample was the Levene test, whose result of p=0.213, therefore greater than 0.05, characterizes the homogeneity of the variances. Regarding the verification of statistical normality of the data, the Shapiro-Wilk test was applied, whose variable values were p<0.05, attributing the condition of non-normality of the data.

Thus, the data were considered non-parametric, so the Kruskal-Wallis mean test was applied for significance and subsequent comparison of means. The following results were obtained (Table 1):

Table 1: Nonparametric significance using the Kruskal-Wallis test

Variable	P value
Current Liquidez	0,307
Dry liquidity	0,325
Liquidez imediata	0,023**
General liquidity	0,215
Degree of indebtedness	0,001**
Composition of indebtedness	0,004**
ROI	0,023**
ROE	0,006**
Net Margin	0,228
Asset turnover	0,114

Value of p<0.01** there is a statistical difference between the means
Source: Survey data (2024).

The results were presented in tables, considering the temporal evolution of the indicators and the comparison between the companies that disclose their sustainability report with or without a technical audit opinion.

PRESENTATION AND DISCUSSION OF RESULTS

Sustainability reports were used as the basis of the research, with the objective of analyzing the performance of companies that disclose or not disclose the report. In the Financial Statements, data were collected that support the liquidity, indebtedness and profitability indicators. The survey was carried out covering both companies that do not disclose their Sustainability Report and those that do, with or without an audit opinion, along with the analysis of the economic and financial performance of each group.

The study aimed to analyze the performance of companies that disclose or not the Sustainability Report. In the Financial Statements, data on liquidity, indebtedness and profitability indicators were collected. The survey covered both companies that do not

disclose their report and those that do, with or without an audit opinion, along with the analysis of the economic and financial performance of each group.

After analyzing the economic and financial indicators of the last 5 years, the mean was calculated and the Kruskal-Wallis mean test was performed in order to verify the significance of the data obtained. Based on this, the companies were classified into three groups: PRS (companies that publish the Sustainability Report), NRS (companies that do not publish the Sustainability Report) and RSA (companies that publish the Sustainability Report with an audit report).

Initially, liquidity ratios were examined to assess the company's ability to meet its financial commitments and its ability to transform assets into resources. According to Table 2, in relation to the current liquidity indicator, the companies that publish the sustainability report have the highest average of 46.21. Next are the companies that do not publish sustainability reports, with an average of 41.89, followed by companies that disclose the sustainability report with an audit report, which record an average of 36.05. Despite the differences in the means, according to the statistical test applied, the equal letters indicate that the results do not present statistically significant differences between them.

According to Assaf Neto (2020), this index reflects the company's ability to honor its short-term obligations with the available short-term resources. The statistical results show that the three groups of companies have this capacity.

Table 2: Comparison test between averages, for the variable Current Liquidity.

ENTERPRISE	MEDIUM
PRS	46.21 to
NRS	41.89 to
RSA	36.05 to

*p<0.01 using the Kruskal-Wallis statistical test
Averages followed by distinct letters differ statistically from each other.
Source: Survey data (2024).

Based on Table 3, it can be seen that there are no statistically significant differences between the groups, as indicated by the equal letters.

However, when analyzing the averages referring to dry liquidity, an indicator that evaluates a company's ability to pay, it is observed that companies that disclose their sustainability report have an average of 46.04. Next are the companies that do not disclose reports, with an average of 41.81, and, finally, the companies that have sustainability reports with an audit opinion, with an average of 36.13.

Table 3: Comparison test between means for the variable Dry Liquidity

ENTERPRISE	MEDIUM
PRS	46.04 to
NRS	41.81 to
RSA	36.13 to

*p<0.01 using the Kruskal-Wallis statistical test
Averages followed by distinct letters differ statistically from each other.
Source: Survey data (2024).

Analyzing Table 4, it is possible to observe that, according to the Kruskal-Wallis parameter, the means presented show a different comparison, identified by the letters a, ab, and b, indicating a numerical and statistical difference.

The results indicate that the companies that have a higher average of the quick ratio ratio, with 51.29, are the companies that publish their accounting report without the audit opinion; Next, with an average of 44.78, are the companies that do not disclose the audit report, and finally the companies that have the audit report in their report, with an average of 33.65.

This indicates that companies that only publish their sustainability report have better immediate liquidity, as they have a greater amount of cash or cash equivalents (available) to meet their short-term financial obligations quickly. In addition, the results reveal that, among the three classifications, the lowest average belongs to companies that disclose their report with an audit opinion.

Table 4: Comparison test between averages, for the variable Quick Liquidity

ENTERPRISE	MEDIUM
PRS	51.29 to
NRS	44,78 from
RSA	33,65 b

*p<0.05 using the Kruskal-Wallis statistical test
Averages followed by distinct letters differ statistically from each other.
Source: Survey data (2024).

The analysis of Table 5 reveals that companies that disclose sustainability reports, with or without an audit opinion (39.68 and 46.54, respectively), have a higher average compared to companies that do not disclose these reports. However, the statistical test performed indicates that there are no statistically significant differences in relation to the overall liquidity between these groups. This ratio measures the ability of organizations to meet their obligations in the long term, considering the resources that can be converted into cash in both the short and long term.

Subsequently, the analysis of the indebtedness ratios, highlighted in Tables 6 and 7, was carried out, covering the degree and composition of indebtedness. This analysis allows

us to evaluate, based on the averages presented, whether the company is preferably using equity capital or third-party capital.

Table 5: Comparison test between averages, for the variable General Liquidity

ENTERPRISE	MEDIUM
PRS	46.54 to
RSA	39.68 to
NRS	32.19 to

*p<0.01 using the Kruskal-Wallis statistical test
Averages followed by distinct letters differ statistically from each other.
Source: Survey data (2024).

An interpretation, in the light of accounting, deserves to be highlighted to give coherence to the findings. Although the literature states that 78% of the publications affirm a positive relationship between corporate sustainability and financial performance (Alshehhi; Nobanee; Khare, 2018); it is worth calling attention to Lopez; Garcia; Rodriguez (2007) who point to the lack of consensus on this issue. Some studies with companies included in the Dow Jones Sustainability Index (DJSI), the liquidity shows negative results when actions in favor of sustainability begin.

In another aspect, based on Table 6, it is observed that in relation to the degree of indebtedness, which indicates the company's financial dependence on third parties. Companies that publish the sustainability report with an audit opinion have the highest average of 46.40, followed by companies that only disclose the report, with an average of 31.08, and those that do not disclose the report, with an average of 24.94.

The statistical test carried out confirms significant numerical and statistical differences between the averages of the companies that disclose and those that do not disclose. Companies that report sustainability report report a higher level of third-party indebtedness compared to those that do not. For Ribeiro (2014), the lower the proportion of third-party capital, the lower the degree of indebtedness, which results in greater financial freedom for decision-making. As a result, according to the results presented, companies that do not disclose their reports demonstrate this greater financial freedom.

Table 6: Comparison test between means for the variable Degree of Indebtedness

ENTERPRISE	MEDIUM
RSA	46.40 to
PRS	31.08 abs
NRS	24.94 b

*p<0.001 using the Kruskal-Wallis statistical test
Averages followed by distinct letters differ statistically from each other.
Source: Survey data (2024).

In Table 7, it is possible to analyze the composition of indebtedness, which represents the proportion of total debt with third parties that is payable in the short term. It is observed that the companies that disclose the report with an audit opinion maintained the highest average compared to the other two groups, registering an average of 45.34. Next are the companies that do not disclose a report, with an average of 33.08, and the companies that only disclose the report without an audit opinion, with an average of 23.04.

For this index, the lower the better, as it indicates a lower proportion of debt with third parties that is payable in the short term. Statistical analysis reveals significant differences between the groups of companies classified, especially with regard to indebtedness. Notably, companies that only publish the report without an audit opinion are in a more favorable situation compared to the others.

From an accounting perspective, the revelations of Alshehhi, Nobanee and Khare (2018) and Lopez, Garcia and Rodriguez (2007), described in the analysis of liquidity ratios, are directly related to indebtedness; evidencing a correlation between the numbers found and the business reality. The indebtedness of companies listed on B3 is supported by financing for corporate investments aimed at the execution of green policies.

Table 7: Comparison test between means for the variable Composition of Indebtedness

ENTERPRISE	MEDIUM
RSA	45.34 to
NRS	33.08 abs
PRS	23.04 b

*p<0.001 using the Kruskal-Wallis statistical test
Averages followed by distinct letters differ statistically from each other.
Source: Survey data (2024).

Continuing with the analysis of the indicators that demonstrated a statistically significant difference, the rate of return on investments evaluates the efficiency of the company in generating profits from its investments.

According to Table 8, the companies that disclose their sustainability report with an audit opinion have an average of 43.52, followed by the group of companies that only disclose, with 39.96, and by the companies that do not disclose, with 26.56. This sequence shows that companies that prioritize the disclosure of the report achieve a higher return on their investments, compared to companies that do not disclose it.

The proximity of the return rate of 100% indicates higher profits generated by the company, reflecting the profitability of the investments made, which can be financed by both equity and third-party capital, enhancing this return.

Table 8: Comparison test between means for the ROI variable

ENTERPRISE	MEDIUM
RSA	43.52 to
PRS	39.96 abs
NRS	26.56 b

*p<0.05 using the Kruskal-Wallis statistical test
Averages followed by distinct letters differ statistically from each other.
Source: Survey data (2024).

Regarding the return on equity, it can be seen in Table 9 that the companies that publish the sustainability report with an audit report maintained the best average (45.49) compared to the other groups. Companies that do not disclose had the second highest average, with 30.47, while those that only disclose the report obtained 26.38. These last two groups did not show statistically significant differences, according to the analysis performed.

The return on equity ratio measures the ratio of net income to invested equity. This indicator is crucial to assess how efficiently the company uses its equity capital to generate profit.

Table 9: Comparison test between means for the ROE variable

ENTERPRISE	MEDIA
RSA	45,49 a
NRS	30,47 b
PRS	26.38 b

*p<0.01 using the Kruskal-Wallis statistical test
Averages followed by distinct letters differ statistically from each other.
Source: Survey data (2024).

Table 10 shows that companies that disclose sustainability reports, with or without an audit opinion (42.13 and 37.96, respectively), have a higher average net margin than those that do not disclose their sustainability reports (31.53). This indicator reflects the company's potential to generate its own profit in relation to its sales, being essential for the analysis of corporate profitability.

Despite the different means between the groups, means followed by equal letters indicate that there are no statistically significant differences between them.

Table 10: Comparison test between averages, for the variable Net Margin

ENTERPRISE	MEDIUM
RSA	42.13 to
PRS	37.96 to
NRS	31.53 to

*p<0.01 using the Kruskal-Wallis statistical test
Averages followed by distinct letters differ statistically from each other.
Source: Survey data (2024).

Regarding asset turnover, in Table 11, the companies followed the following order: those that publish the sustainability report with an opinion presented an average of 43.00, followed by those that only publish the report with 36.17, and those that do not disclose the report recorded 30.44. This indicator indicates that the higher the asset turnover, the better, as it means that the company is generating more revenue from the same asset base, reflecting greater operational efficiency.

Table 11: Comparison test between averages, for the variable Asset Turnover

ENTERPRISE	MEDIUM
RSA	43.00 to
PRS	36.17 to
NRS	30.44 to

*p<0.01 using the Kruskal-Wallis statistical test
Averages followed by distinct letters differ statistically from each other.
Source: Survey data (2024).

Although the averages of the companies' classifications are different, the averages followed by identical letters do not present statistically significant differences between them.

In the study conducted by Fraga et al. (2021), the application of the Mann-Whitney median test also did not show significant results. These findings corroborate the results of this survey, specifically in relation to the current liquidity, dry liquidity, general liquidity, net margin and asset turnover ratios. Thus, both this study and the aforementioned research indicate that there are no statistically significant differences in these indicators between the groups analyzed.

Therefore, from an accounting perspective of numbers, the connection of the bibliography with the objectives of this research is evidenced here. Studies were cited pointing to a positive association between CSR and economic performance; that is, profitability. Oliveira et al. (2015) in their proofs at B3 disclosed that there is a positive correspondence between the use of green shares (CSR) and an increase in Shareholders' Equity, i.e. higher profits.

FINAL CONSIDERATIONS

The present study sought to analyze the relationship between the disclosure of sustainability reports, accompanied or not by audit opinions, and the economic and financial performance of publicly traded companies in the energy sector. The sample consisted of 77 companies that published their Standardized Financial Statements (DFPs) in the period from 2019 to 2023. Of these, 47 companies disclosed their sustainability report with an audit report, 12 released the report without an opinion, and 18 companies did not disclose the sustainability report.

In view of the results obtained, when analyzing whether there were statistically significant differences through the Kruskal-Wallis test, it was found that the companies present a similar performance in several aspects, with no significant difference between some groups analyzed. There was no distinction in the performances related to the ratios of current liquidity, dry liquidity, general liquidity, net margin and asset turnover.

However, significant differences were observed in the quick ratio, in the indebtedness ratios (degree of indebtedness and composition of indebtedness), as well as in the ROI and ROE indicators. These results were significantly higher for companies disclosing the sustainability report.

Regarding the liquidity ratios, there was no statistically significant difference between the groups. Although the companies that do not disclose their sustainability report have a lower average than the other two groups, the values did not show a statistical difference. Considering the positive immediate liquidity of sustainable companies, it becomes plausible to verify in the future, in the medium term, whether the other indices will surpass those of companies that do not disclose their sustainability reports.

With regard to the debt ratio, it is noted that companies that publish their sustainability reports have a higher degree and composition of indebtedness compared to those that do not. Although such undertakings rely more on third-party capital, that condition should not necessarily be interpreted as negative. It can serve as a verification of financing for corporate investments for the execution of sustainable policies.

This perspective is important for long-term investors. By focusing on the long term, investors are looking for sustainable growth and a superior return on the capital that has been invested, recognizing that sustainability can provide competitive advantages and greater future financial stability.

With regard to profitability indexes, the ROI (Return on Investment) and ROE (Return on Equity) indicators showed statistical differences. Companies that publish their sustainability report, with or without an opinion, had a higher average ROI compared to those that do not, which is a finding that the adoption of CSR policies contributes to an increase in net worth. Regarding the net margin and asset turnover indicators, there were no statistically significant results that differentiated the groups, not favoring any of them in particular.

The results of this study contribute to the literature by providing an understanding of the relationship between the disclosure of sustainability reports and the economic and financial performance of publicly traded companies in the energy sector. The survey highlights the importance of transparency in sustainable practices and demonstrates how

the disclosure of this information can influence the financial evaluation of companies. The findings serve as a reference for investors, managers and researchers, helping in the formulation of investment strategies and in the advancement of future studies in this area.

As a limitation of the study, the size of the sample stands out, since data were used only from companies that disclosed their standardized financial statements in a given period.

For future research, studies with statistical techniques based on larger samples are suggested, in order to obtain normality of the data. It is also relevant to analyze sustainability reports and CSR practices. In addition, it is recommended to investigate whether investors choose to invest their capital based on the information disclosed in sustainability reports.

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