


## VALUE ADDED STATEMENT AND ESG INFORMATION

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### ABSTRACT

This research aimed to investigate how the Value-Added Statement (VAS) may contribute as a financial information disclosure source with a social objective compared to the Environmental, Social, and Governance (ESG) measures available in the market. For this, information was collected related to the value-added distributed by 388 Brazilian companies listed on B3 from 2010 to 2022, as well as the respective aggregate ESG indices by pillars and the score of the Refinitiv Eikon database. The factor analysis indicated that the categories of distributed value added clustered only with the Governance pillar, not being related to the social and environmental pillars. However, through regressions with control variables and fixed effects of company and year, it was found that companies with higher levels of value distribution to creditors, which occurs mainly in the form of interest payments, have lower scores in the Environmental pillar, with no relationship between the other variables and pillars. The results indicate, therefore, that the information in the VAS needs to be complemented by the constants in the ESG scores.

**Keywords:** Value Added Statement (VAS). Social Responsibility. ESG.

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## 1 INTRODUCTION

The present research aimed to investigate how the Value-Added Statement (VAS) may contribute as a financial information disclosure source with a social objective compared to the most comprehensive Environmental, Social, and Governance (ESG) measures available in the market.

In more recent years, there has been a growing interest in discussions about whether the role of accounting should be limited only to the reporting of measures focused on informing shareholders and creditors or if it should also consider environmental and social issues that reflect the role of the company in society and not only in the economy and financial market. One of the arguments for this is that sustainable companies could generate more value in the long run than their peers (Hartzmark et al., 2019; WEF, 2020a) and that this would justify the disclosure of focused information to others stakeholders in addition to the primary users of the accounting information.

Requests from key financial market participants for corporate disclosures of ESG information (Fink, 2018; 2021) and voluntary disclosure projects such as the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), and the Integrated Reporting (<IR>) are indications of the pressure for changes in corporate performance communication. Even the World Economic Forum (WEF) has developed, in partnership with the four largest external auditing firms in the world, a framework for disclosing ESG metrics based on the concepts of materiality and verifiability (WEF, 2020b).

However, reports of a voluntary disclosure nature, such as the GRI and the <IR>, still encounter difficulties in a homogeneous publication among market participants, partly due to their complexity and the cost linked to information generation, for example. Seeking to minimize this problem, the IASB issued, in June 2023, to be valid from January 2024, two standards related to the disclosure of sustainability information; however, there are still many concerns about the viability of these standards due to the very nature of environmental and social information, which are different from financial information (Burzillo et al., 2023). In addition, previous research has indicated that companies that signal sustainable behavior are typically larger and have more significant financial results than their peers (Flammer, 2021; Raghunandan & Rajgopal, 2021).

Given this scenario, therefore, we discuss in this paper the role of the Value-Added Statement as a financial statement of a social nature but with a lower implementation cost (globally) than alternatives of voluntary disclosure or according to Standards S1 and S2 of the International Financial Reporting Standards (IFRS). In addition, the VAS is a measure already established in the Brazilian market and still little explored in the accounting literature as an ESG tool. The value-added measure evinces the value of economic wealth generated by the business activity in a given period (Iudícibus et al., 2010). In the macroeconomic aspect, the value added generated by all companies in an economy translates as the generation of National Income, while the microeconomic aspect focuses on the informational potential of distributing the value generated by companies to employees, government, creditors, and shareholders for negotiating contracts and evaluating the justice and ethics in the division of wealth (Evrart & Riahi-Belkaoui, 1998; Santos & Lustosa, 1998; Haller et al., 2018).

As an ESG metric, this paper employed the one made available by the Refinitiv Eikon platform, which provides both aggregated ESG data and data separated by pillar and score. The VAS data were obtained from the Harvard Dataverse repository, compiled by Perlin (2023) (public domain) from the Securities and Exchange Commission system. Information was collected for Brazilian companies listed on B3 from 2010 to 2022, totaling 388 companies and 3,665 observations.

For data analysis, this paper employed descriptive statistics to describe the behavior of value-added distributions versus the ESG pillars over time. In addition, a factor analysis was also performed to understand how the value-added distributions cluster with the ESG pillars, and,

finally, predictive analyses were performed through linear regressions with fixed effects of company and year.

As the main results of the factor analysis, this research identified that the Governance pillar drew near the distributed value-added categories of Personnel, Government, Creditors' Equity, and Owner's Equity, whereas the Environmental and Social pillars formed a separate factor. Thus, among the ESG variables, the one with the most information in common with the VAS was the Governance pillar. Subsequently, regressions were generated with fixed effects of company and year, with the dependent variables being (a) one of the three ESG pillars and (b) each of the scores that form the pillars. The dependent variables were the categories of distributed value added. In the regressions with the ESG pillars, the value-added distribution variables were only able to explain the score of the Environmental pillar. More specifically, companies with higher levels of value-added distribution to creditors have lower environmental scores. It was not possible to observe other relationships between the VAS data and the ESG scores, which indicates, however, that the information contained in the VAS must be complemented by the information in the ESG scores.

This article is organized as follows: the present section introduced the study and presented its main points. Section 2 briefly discusses the key points of the literature to support the construction of the methodology and analysis of the results. Sections 3 and 4 detail the data collection and analysis techniques and discuss the findings, respectively. Section 5 concludes the paper.

## 2 THEORETICAL FOUNDATION

### 2.1 The value-added concept

Accounting is a science seen as a social phenomenon that deals with increasingly complex contexts, which has led the area to stop being seen only as a tooling technique and start to be perceived as an instrument of managerial and social change over time. It was in this context that the emergence of the value-added measure was identified in the literature: it was one of the situations of interweaving between accounting science and the social aspect (Burchell et al., 1985).

At the end of the 1970s, in the United Kingdom, there was a growing interest in the value-added measure, reflected in much of the academic literature of the time when a concern with social change in accounting was emerging (Burchell et al., 1985). Two studies of the time that may be highlighted are Gilling (1976) and Wells (1976).

Gilling (1976) argued that the accounting change needed for the field to reflect the environmental discussions of the time was lagging due to conflicts of interest of accountants over what the modifications to accounting practice should be. In addition, Gilling (1976) stated that accounting is reactive to social changes, which means that it is necessary to wait for the change in the environment so that it is reflected in accounting. However, Wells (1976) presented the opposite argument: because accounting participates in the social environment, it also influences this environment, thus being able to change it according to the evolutions arising from conflicts in the field itself.

It was in this context that value added arose. According to Burchell et al. (1985), the measure received attention from the accounting class from a discussion paper published in 1975 by the United Kingdom accounting regulator. Such a report recommended that companies release a statement that spelled out the construction of the value added and the benefits of the value generated to employees, government, and capital providers. From 1979 to 1980, 30% of the companies of the Institute of Chartered Accountants of England and Wales disclosed the VAS in their annual reports<sup>1</sup>. In the United States, the disclosure recommendation was later (1991) through

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<sup>1</sup> From the 1980s, there was a decline in the dissemination of the VAS in the United Kingdom (Burchell et al., 1985).

the accounting measurement and audit committee of the American Accounting Association (Riahi-Belakoui & Fekrat, 1994).

The enthusiasm of these companies in the late 1970s to disclose the accounting metric of value-added draws attention. Evraert and Riahi-Belkaoui (1998) pointed out that potential advantages of disclosing the value added in statements other than the primary statements<sup>2</sup> include social factors in both the microeconomic and macroeconomic spheres. Regarding the first, the authors listed advantages such as negotiations by workers on labor compensation, the possibility of measuring bonuses for productivity, and an approximate metric of size better fitted than net sales revenue.

In this microeconomic aspect, it is observed that the value-added measure conceptually provides useful information for decision-making not only for primary users of accounting information but also for other groups interested in companies that are not necessarily satisfied only with traditional measures of cash and profit (Cunha et al., 2005; Haller et al., 2018).

Relative to the macroeconomic sphere, Evraert and Riahi-Belkaoui (1998) considered that the informational contribution of the VAS comes from the generation of measures of National Income and economic development of a territory. To Santos and Lustosa (1998), through the value added, one emphasizes the process of wealth generation from the transformation of productive resources of labor, capital, and wealth, which are compensated through salary, interest, rent, taxes, and profit. This compensation represents income destined to society, which returns to companies through the acquisition of products, services, and financing, feeding back the economic cycle (Santos & Lustosa, 1998).

Haller et al. (2018) highlighted that value added as an informational piece indicates justice in the distribution of wealth among stakeholders who contributed to the generation of value. Therefore, there is a relevant potential for the measure as an ESG metric in the Brazilian context, given the availability of the report due to its mandatory disclosure.

## **2.2 The relationship between value added and environmental, social, and governance metrics**

In 2018, Larry Fink, president of asset manager BlackRock, addressed in his annual letter to CEOs the importance of aligning the corporate purpose with the agents that interact with the firm – in this case, stakeholders – beyond shareholders in order to think about a corporate governance model focused on the long term (Fink, 2018). In 2021, Fink further highlighted the importance of this information by contextualizing it with the COVID-19 pandemic, reinforcing that companies must seek to generate value in the long term (Fink, 2021).

According to Bebchuk and Tallarita (2020), one may trace legal concerns with stakeholders back to the 1930s. However, the authors pointed out that throughout the contemporary history of corporate law, the interests of shareholders relative to other parties have always been prevalent. In 2019, however, the most prominent American companies signed a joint agreement of public commitment to corporate responsibility towards stakeholders other than shareholders: the 2019 Business Roundtable Statement; it was questioned whether it would be the only one (Bebchuk & Tallarita, 2020).

To monitor the fulfillment of this commitment to stakeholders, companies must disclose their actions and the respective results. Given the lack of regulation in this aspect of the reporting of ESG information, data on this topic are still voluntary. Verrecchia (1983) argued that, in an environment where a manager may choose between disclosing negative and positive information about their firm, the market has the ability to identify when the undisclosed information is harmful, provided that the expectations of rational economic agents are met.

However, this assumption assumes that the processing of such information will be the same between agents, which may not be true in the context of voluntary disclosures. Christensen et al.

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<sup>2</sup> Balance Sheet, Income Statement, and Statement of Cash Flows.

(2021) indicated that the most used ESG metrics do not enter into consensus within the evaluations of corporate performance among the three pillars. In addition, Raghunandan and Rajgopal (2021) showed that ESG indices did not incorporate material information on compliance breaches with stakeholders, such as the number of labor lawsuits or violations of environmental laws.

In this scenario that ESG indices may not have consensus among themselves on the pillars they deem to evaluate or even not include material information, there is the possibility of turning to regulated information with a more social focus than the net income of the period: the value added. Haller and Van Staden (2014) defined value added as the value that a company "adds" to an item from the time it is acquired until the time that item is sold to a third party (whether or not that item is combined with other business expenses, such as labor and raw materials). In summary, the value added represents the corporate wealth creation for a country's economy (Iudícibus et al., 2010).

Cosenza (2003) highlighted two methods for calculating value added: the additive and the subtractive. The subtractive form assumes that the value added equals the subtraction of costs from the revenues of the sold products and goods. The additive method, in turn, demonstrates that value added is the sum of (i) personnel costs and expenses, (ii) financial expenses, (iii) amortizations, depreciations, depletions, and provisions, (iv) profit tax and other taxes, (v) dividends and interest on owner's equity, and (vi) reserves and profits retained by the company (p. 12).

The subtractive method results in the total added value generated by the entity, while the additive method indicates how this value was distributed among the economic agents. It is the additive method that highlights the potential of the value-added measure to be a metric of the economic and social impact of a company, with space to be considered an indicator of sustainable performance (Haller & Van Staden, 2014).

This condition is because the statement disclosing the value added is based on the macroeconomic concept of Gross Domestic Product (GDP), as discussed in Subsection 2.1. However, this statement is based on the accrual basis, just as the Income Statement (Iudícibus et al., 2010). In the following Subsection 2.3, we discuss the structure of the VAS and how the subtractive and additive methods are demonstrated in the report.

### **2.3 The value-added statement**

The VAS is an accounting statement with the primary objective of demonstrating the value of economic wealth generated by the business activity within a tax period. As discussed in Subsection 2.1, it is understood that this amount is the result of the effort of four main parties: (i) personnel (employees), (ii) taxes/fees and contributions (government), (iii) remuneration of creditors' equity (creditors), and (iv) remuneration of owner's equity (members) (Iudícibus et al., 2010).

Unlike what international standards propose as primary users of general-purpose accounting information – in this case, creditors and investors (CPC, 2019), the VAS provides information of interest to the previously listed company stakeholders. In this sense, it complements the information available in the Income Statement (Cunha et al., 2005) by highlighting, from revenue and other items contained in the income or loss of the period, how a company generated economic value through the operating activity and how this value was destined to the stakeholders that contributed to the generation of this added value (Cosenza, 2003).

The emphasis on the construction of information is based on the "residual value" (in this case, the value added) generated by the company from the interaction between customers and managers (Revenue), suppliers, employees, and the government (Inputs acquired from third parties), consumption of operating assets (Depreciation, amortization, and depletion). The VAS also considers that a company may receive value from other parties, such as financial and equity income from investments in affiliates or subsidiaries (Figure 1, item 4). The added value to be distributed is highlighted, while the distribution of this value among stakeholders is unfolded in

four categories: (i) Personnel, (ii) Government, (iii) Remuneration on Creditors' Equity, and (iv) Remuneration on Owner's Equity.

Initially, the VAS disclosure was voluntary by Brazilian companies, with the first record of an incentive to this publication stemming from the Securities and Exchange Commission in 1992 (CVM, 1992; Santos, 2005). The disclosure became mandatory with the enactment of Law No. 11638/2007, which promoted changes to Law No. 6404/1976, which governs Corporations in Brazil (*Lei n.º 6.404, 1976; Lei n.º 11.638, 2007*). The updates promoted by Law No. 11638/2007 and the partnership of key members of the market through the *Comitê de Pronunciamentos Contábeis* (CPC, Accounting Pronouncements Committee) culminated in the full adoption of the International Financial Reporting Standards (IFRS) in 2010.

**Figure 1**  
VAS Structure

Generation of value added	
1.	Revenues
2.	Inputs Acquired from Third Parties
3.	Depreciation, Amortization, and Depletion from the VAS
4.	Value Added Received in Transfer
Distribution of the value added	
5.	Personnel
5a.	Direct Compensation
5b.	Benefits
5c.	FGTS
6.	Taxes, Levies, and Contributions
6a.	Federal Taxes, Levies, and Contributions
6b.	State Taxes, Levies, and Contributions
6c.	Municipal Taxes, Levies, and Contributions
7.	Remuneration on Creditors' Equity
7a.	Interest
7b.	Rentals paid or credited to third parties
7c.	Other remunerations on creditors' equity
8.	Remuneration on Owner's Equity
8a.	Interest on the Owner's Equity paid or credited to shareholders, members, or holders
8b.	Dividends paid or credited to shareholders, partners, or holders
8c.	Retained profits/losses for the period
8d.	Share of non-controlling shareholders in the retained profits

However, it is important to note that international standards do not require the VAS to be mandatory for the jurisdiction to be acknowledged as an adopter of the international standard. To date, Brazil is the only country in the world that requires the disclosure of the VAS for companies listed on the capital market (Haller & Van Staden, 2014). In this sense, in the mandatory disclosure of the VAS in the Brazilian market, a unique environment is observed to explore in the literature on financial reporting and sustainable development from the use of an ESG metric that stems from accounting profit.

Although there is only one country with mandatory VAS disclosure, some companies worldwide disclose "economic value" information voluntarily as an integral part of the reported Corporate Social Responsibility (CSR) information using the framework proposed by the Global

Reporting Initiative (GRI). Van Staden et al. (2013) pointed out that the GRI concept of "economic value" is very similar to that of "added value". It is understood that this voluntary disclosure reflects the European discussions of the 1970s on how to report the achievement of corporate social responsibility (Haller & Van Staden, 2014).

### 3 METHODOLOGICAL PROCEDURES

To meet the research objective, information presented in the VAS was collected for Brazilian companies listed on B3 from 2010 to 2022, as compiled by Perlin (2023) and made available on the Harvard Dataverse platform, which totals 388 companies and 3,665 observations. The choice of the sampling period is justified by the availability of information for collection in a database, given that there was no obligation to disclose the VAS before 2010, up to the most recent data availability.

The score of the Refinitiv ESG index is disclosed by the three pillars<sup>3</sup> (Figure 2) and as a consolidated index of these three pillars and points of controversy. The score ranges from 0 to 100, with zero being the worst.

**Figure 2**

*Categories that make up the pillars of the Refinitiv Eikon ESG score (Refinitiv, 2021)*

Environmental Pillar		Social Pillar		Governance Pillar	
1.	Use of resources	4.	Workforce	8.	Management
2.	Emissions	5.	Human rights	9.	Shareholders
3.	Environmental innovation	6.	Community	10.	CSR strategy
		7.	Product liability		

Source: Refinitiv (2021).

The interpretation of the index indicated by the database (Figure 3) is made in quartiles, and the score indicates both the ESG performance of the company and the transparency of the information collected (Refinitiv, 2021).

**Figure 3**

*Score ranges of the Refinitiv Eikon ESG index*

Score range	Description	Interpretation
0 to 25	First quartile	Scoring within this range indicates poor relative ESG performance and an insufficient degree of transparency in generating public reports of ESG material data.
> 25 to 50	Second quartile	Scoring within this range indicates satisfactory relative ESG performance and a moderate degree of transparency in generating public reports of ESG material data.
> 50 to 75	Third quartile	Scoring within this range indicates good relative ESG performance and an average degree of transparency in generating public reports of ESG material data.
> 75 to 100	Fourth quartile	Scoring within this range indicates excellent relative ESG performance and a high degree of transparency in generating public reports of ESG material data.

Source: Refinitiv (2021).

For data behavior and trends analysis, we used both the aggregate index provided by the database and the scores by pillar. The techniques used were the following: (1) graphical analyses

<sup>3</sup> For a better visualization of the ESG pillars of the Refinitiv index, see the item "Our approach to ESG" at <https://solutions.refinitiv.com/esg-investing-wealth> (accessed on November 30, 2021).

for initial identification of the behavior of value-added distributions versus the ESG pillars; (2) factor analysis to understand how the value-added distributions cluster with the ESG pillars; (3) predictive analyses through multiple linear regressions with fixed company and year effects. The estimated regressions are according to Equation 1, where the dependent variables are the ESG scores, as specified in Figure 2, the VA Distribution represents the value-added distribution categories, as shown in Figure 1,  $c_i$  are fixed effects of the company, the controls include Return on Assets (ROA), Indebtedness (measured by the ratio of the Total Liabilities and Stockholders' Equity to the Total Assets), and Size (measured as the natural logarithm of the Total Assets),  $\gamma_t$  are fixed effects of the year, and  $\varepsilon_{it}$  is the error term:

$$Scores\ ESG_{it} = Distribuição\ de\ VA_{it} + \beta\ Controles_{it} + c_i + \gamma_t + \varepsilon_{it}.$$

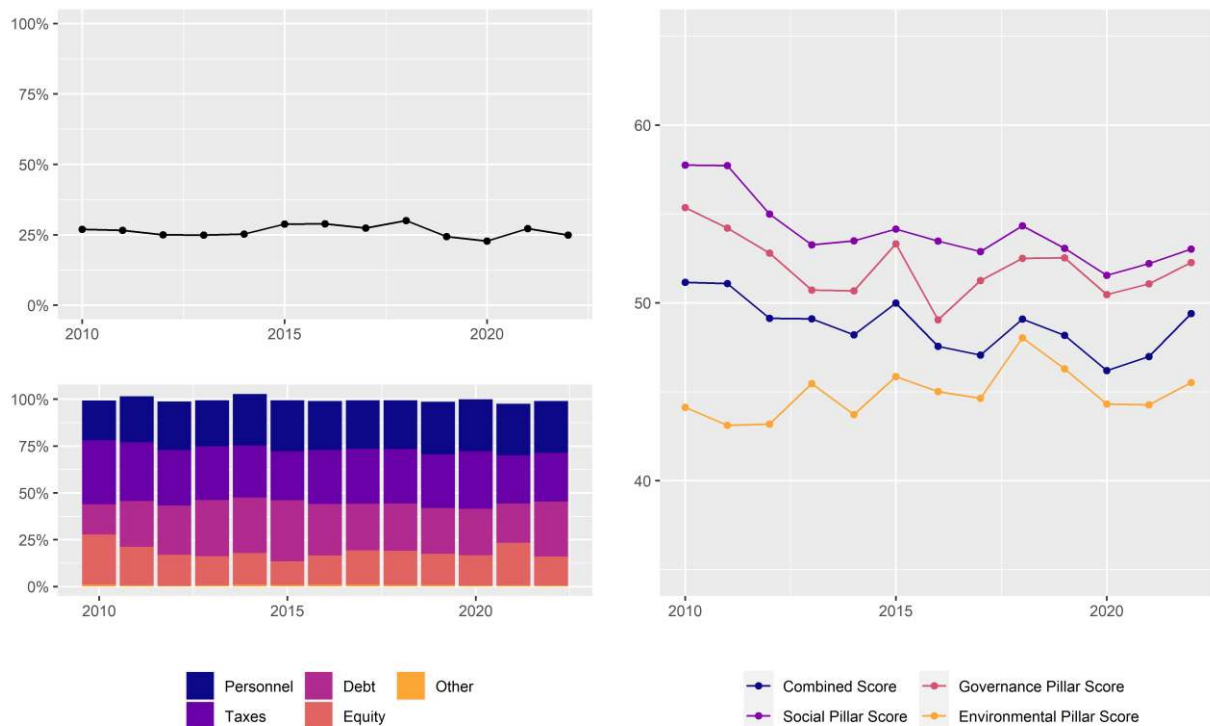
## 4 RESULTS

### 4.1 Descriptive analysis

According to Figure 4, the companies in the sample generated an average of 25% of their total assets in value added each year. This percentage rose slightly in 2015, returning to the mark close to 25% in the following years, with a sharper drop in 2020, probably as a reflection of the COVID-19 pandemic. However, in general, this percentage did not show significant variations throughout the sample period.

**Figure 4**

*Value Added and ESG Variables (mean over the sample period)*



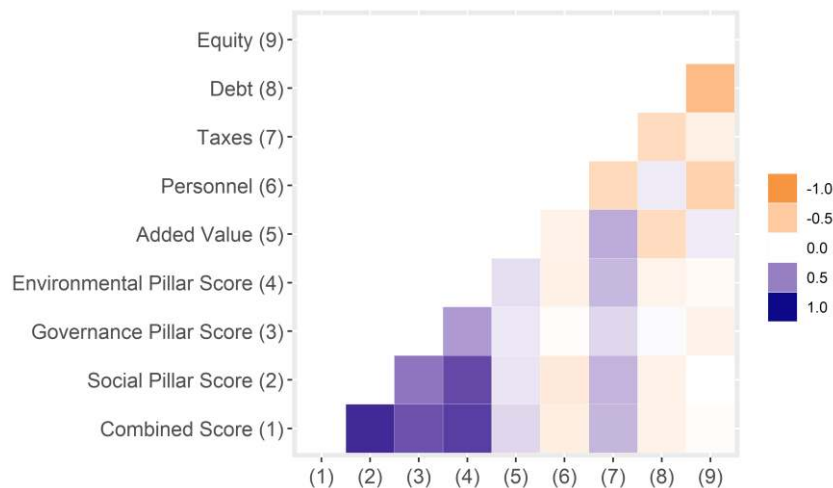
The percentages of distribution of value added among the five categories of the VAS also did not show significant alterations: (i) Personnel, (ii) Taxes, (iii) Creditors' Capital, (iv) Owner's Capital, and (v) Others. On average, of the 106 companies that comprise the sample, 26% of the value added went to the Personnel category, 29% to Taxes, 26% to the Remuneration on Creditors' Equity, and 18% to the remuneration on Owner's Equity (Figure 4).

The mean ESG variables were also reasonably stable throughout the sample period, although it is possible to observe a slight decrease in recent years, except for the Environmental pillar, which showed an upward trend in the period. The average Combined Score – i.e., the score that combines the Environmental, Social, and Governance pillars – was 48.7 (on a scale of 0 to 100). The pillar with the highest evaluation was the Social (mean of 54), followed by Governance (mean of 52). The pillar with the worst classification was the Environmental, with an average of 44.9.

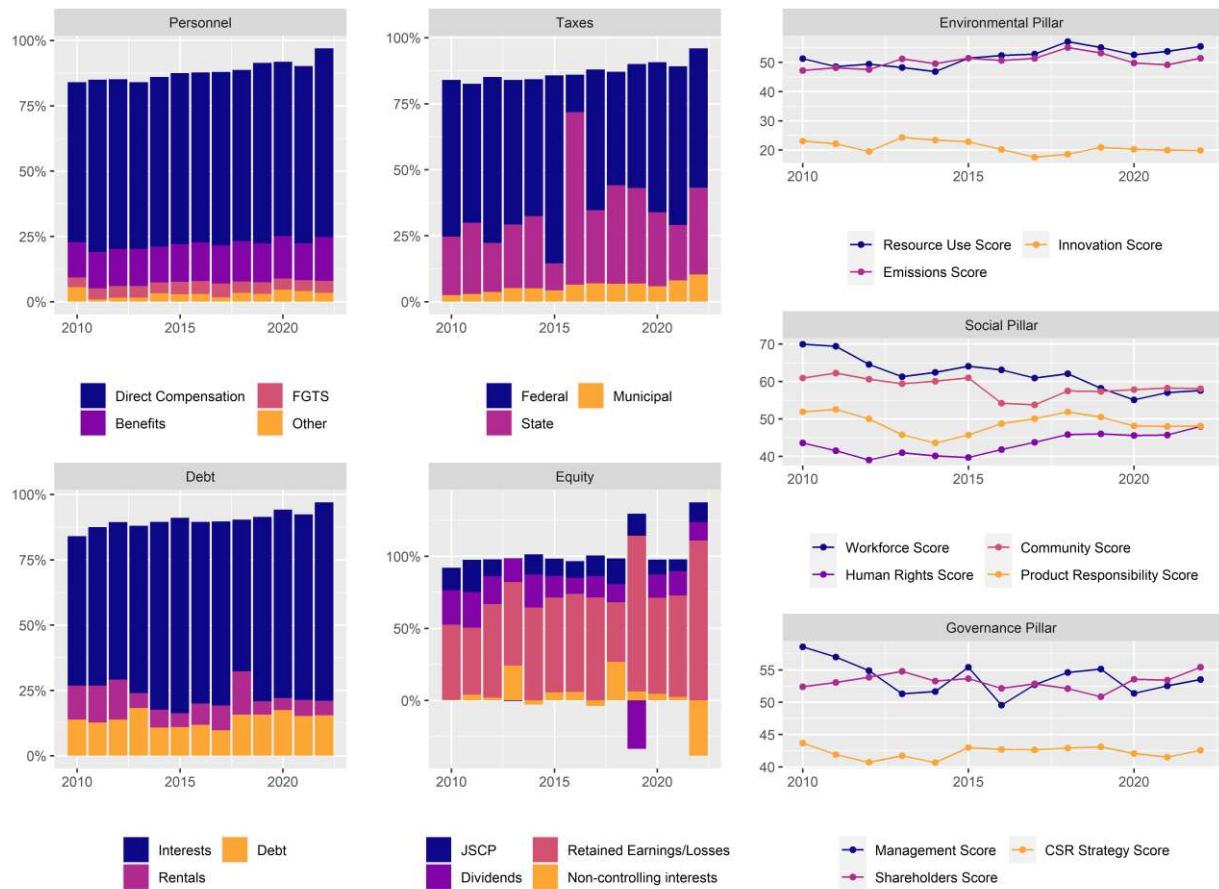
Figure 5 shows the correlations between the variables of Figure 4. In it, it is possible to observe that the ESG variables clustered with each other with high positive correlations, while the Value-Added distribution variables had low correlations with each other and with the ESG variables, except for the high negative correlation between the value-added distribution for the suppliers of Creditors' Capital and Owner's Capital.

Figure 6 shows the breakdown of the value-added distribution categories and ESG pillars. From the figure, it is possible to observe that most of the distribution to Personnel was in the form of Direct Compensation, followed by benefits. Most of the taxes were federal, followed by state taxes. The most significant portion of the remuneration on Creditors' Equity is in the form of Interest, while most of the Owner's Equity is in the form of Profits Retained for reinvestments. There were no particular trends of up or down in these distribution percentages.

**Figure 5**  
*Correlation between Value Added and ESG Variables*



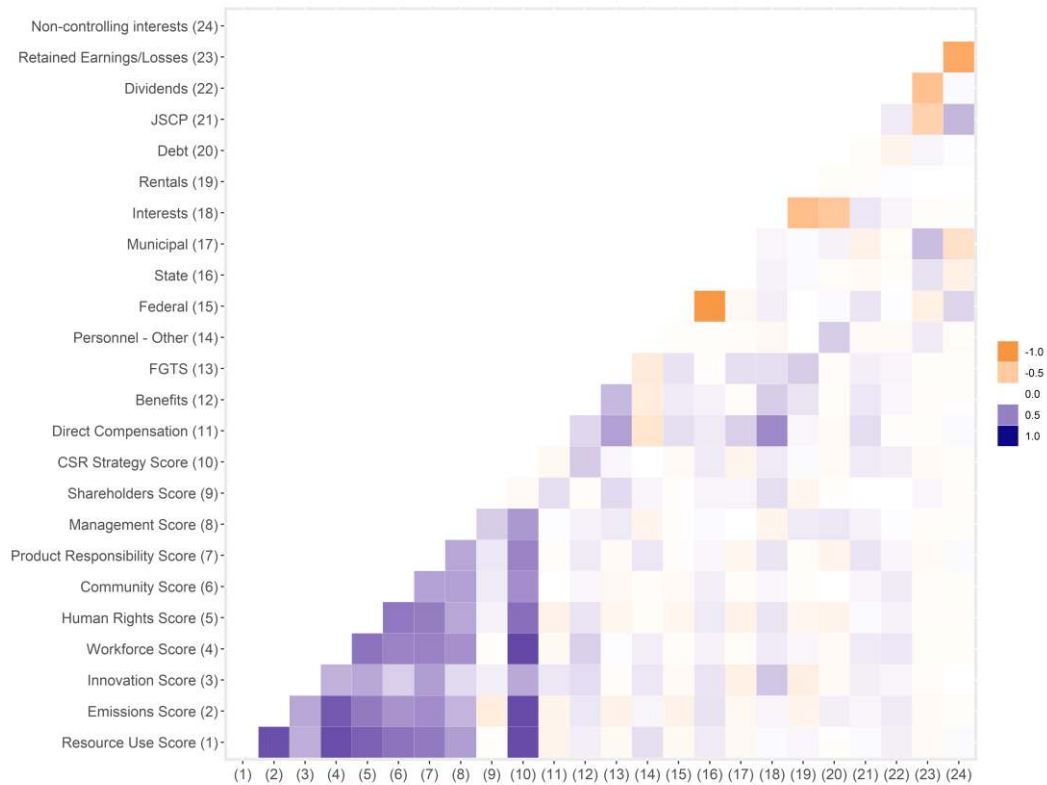
**Figure 6**  
*Breakdown of the Value Added and ESG Variables (mean over the sample period)*



One may also observe in Figure 6 that, within the Environmental pillar, the worst score referred to environmental innovations. In the Social pillar, it is possible to observe a curious trend: while the Human Rights score rose after 2016, the Workforce score decreased in the same period, possibly due to the changes to the Labor Law implemented since then. Finally, regarding the Governance pillar, the Shareholder score was the highest but decreased in recent years, becoming on par with the Management score. The CSR Strategy score was the lowest.

Figure 7 shows the correlations between the detailed ESG and value-added distribution variables, and it is possible to observe the same pattern as Figure 5. In it, it is also possible to observe the high negative correlation between the distribution of value added for federal and state taxes.

**Figure 7**  
Correlations between Value Added and ESG Variables (breakdown)

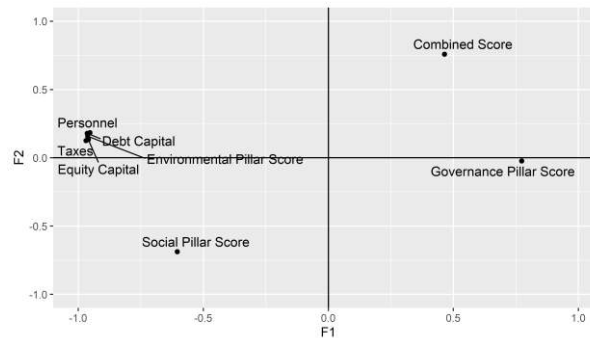


## 4.2 Factorial analysis

To better understand the relationships between the ESG and value-added distribution variables, the research proceeded to a factor analysis by principal components. First, the variables of the three general ESG pillars were used (Environmental, Social, and Governance), together with the four forms of value-added distribution (Personnel, Taxes, Creditors' Equity, and Owner's Equity).

For this first analysis, Bartlett's sphericity test resulted in a statistic of 33,419.83, statistically significant at 1%, so the correlation matrix presented statistically significant correlations between the analyzed variables. In turn, the Kaiser-Meyer-Olkin (KMO) statistic was 0.820, also indicating that the data were suitable for a factor analysis.

**Figure 8**  
*Factor loads*



The analysis generated two factors with eigenvalues greater than one that together explained 87.19% of the total variance. Figure 8 shows the two factors generated, illustrating the factor loads of each variable. From the figure, it is possible to see that the first factor (F1) is composed of positive loads of the scores of the Social and Environmental pillars, while the second factor (F2) is formed by the negative load of the score of the Governance pillar and the Value-Added distribution measures. The factor loads of each variable in each factor are shown in Table 1. Thus, the analysis showed that the Governance pillar approached the Value-Added measures, while the Social and Environmental pillars approached each other, not the distributed value added.

**Table 1**  
*Factor loads by factor and variable*

	F1	F2
Score of the Social Pillar	0.464	0.759
Score of the Governance Pillar	-0.604	-0.688
Score of the Environmental Pillar	0.773	-0.024
Personnel	-0.962	0.158
Taxes	-0.953	0.184
Creditors' Equity	-0.969	0.126
Owner's Equity	-0.964	0.179
Others	-0.960	0.133

It is important to say that the analysis of the detailed variables, i.e., the scores that compose each ESG pillar and the items that make up each VAS distribution category, did not return correlations high enough for factor analysis.

### 4.3 Regression analysis

While the Factor Analysis allows for understanding how variables approach each other without imposing a structure, it fails to control for variations in time and unobserved characteristics. Thus, regression analysis with panel data, despite imposing a previous structure, is useful for understanding the relationships between variables under better-controlled conditions.

That said, regressions were estimated with fixed company and year effects to understand how the value-added distribution variables related to the ESG variables. For the regressions, the distributed value-added variables were Winsorized to 5%, just as the control variables (ROA, indebtedness, and size).

Table 2 shows the results of three regressions, where each ESG pillar is explained by the value-added distribution variables. The model had greater explanatory power for the Environmental pillar, whose adjusted R<sup>2</sup> was 15.7%, against 0.1% for the Governance pillar and a negative value for the Social pillar. Nevertheless, the F-statistic was statistically significant for the three models, indicating the global significance of the explanatory variables. While the factor analysis showed that the Governance pillar approached the VAS variables, once controlled by fixed effects of company and year and by the other variables included in the analysis, it was possible to observe that the value-added distribution variables were only able to explain only the score of the Environmental pillar. More specifically, companies with a higher level of distribution of value added to creditors (which is mainly composed of interest) have lower scores in the Environmental Pillar since the coefficient of the Creditors' Equity variable was negative and statistically significant at 10%. Among the control variables, the size was positively related to all pillars (positive and statistically significant coefficient at 1%). No other variable had a statistically significant coefficient at the usual levels.

**Table 2**
*Results of the between ESG pillars and value-added distribution category*

	<i>Dependent variable:</i>		
	Environmental Pillar (1)	Governance Pillar (2)	Social Pillar (3)
Personnel	0.108 (0.164)	0.079 (0.225)	0.380 (0.328)
Taxes	-0.096 (0.108)	-0.012 (0.182)	-0.117 (0.251)
Creditors' Equity	-0.202* (0.110)	0.001 (0.145)	-0.019 (0.269)
Owner's Equity	-0.053 (0.108)	0.074 (0.179)	0.064 (0.254)
ROA	0.055 (0.242)	-0.670 (0.689)	-0.067 (0.789)
Indebtedness	-0.047 (0.096)	0.034 (0.199)	-0.264 (0.310)
Size	0.174*** (0.026)	0.162** (0.071)	0.283*** (0.086)
Fixed effects of company	Yes	Yes	Yes
Fixed effects of time	Yes	Yes	Yes
Clustered robust errors	Yes	Yes	Yes
Observations	782	782	782
R <sup>2</sup>	0.290	0.160	0.099
Adjusted R <sup>2</sup>	0.157	0.001	-0.071
F-Statistic	14.158***	6.574***	3.799***

Note. \*p < 0.1; \*\*p < 0.05; \*\*\*p < 0.01.

Table 3 shows the regression analysis considering the detailed ESG scores. The explanatory power of the models was also low. The highest adjusted R<sup>2</sup> was for the Resource Use score (part of the Environmental pillar), 14%, but several scores showed negative R<sup>2</sup> values. Nevertheless, the F-statistic indicated the overall validity of all models at a significance of at least 5%. From the table, it is possible to observe that none of the detailed scores relate to the Value-

Added distributions since none of the Personnel, Taxes, Creditors' Equity, and Owner's Equity variables had a statistically significant coefficient.

Although the Environmental pillar was negatively correlated with the distribution of value added to creditors according to the results in Table 2, its components (Resource Use, Emissions, and Environmental Innovation scores) could not be specifically related to the payment of interest (distribution to Creditors' Equity).

Table 3 shows that only the control variables were related to the detailed ESG scores. More specifically, more profitable companies have lower management scores (the coefficient of the ROA is negative and statistically significant in Model 4), more indebted companies have lower resource use and CSR strategy scores (the coefficient of Indebtedness is negative and statistically significant in Models 1 and 6) but higher management scores (the coefficient of Indebtedness is positive and statistically significant in Model 4), which is in line with the results of Table 2, in which the greater distribution of creditors' equity (whose correlation with Indebtedness is 39%) correlated negatively with the Environmental pillar. Finally, larger companies have higher ESG scores since the coefficient of the Size variable was positive and statistically significant in almost all models.

Thus, it is understood that the information contained in the value-added distributions works in a very limited manner as an ESG measure. The VAS focuses on building the added value information from the operating result and showing how a company generated value for the economy following the principle of competence. Therefore, the VAS needs the complement of other ESG information sources.

**Table 3**

*Regressions between disaggregated ESG pillar scores and value-added distribution category*

	<i>Dependent variable:</i>									
	Resource Use Score	Emissions Score	Environmental Innovation Score	Management Score	Shareholders Score	CSR Strategy Score	Workforce Score	Human Rights Score	Community Score	Product Liability Score
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Personnel	0.066 (0.190)	0.129 (0.119)	-0.132 (0.346)	-0.002 (0.103)	0.061 (0.161)	0.224 (0.151)	0.198 (0.217)	0.126 (0.195)	0.076 (0.188)	0.298 (0.189)
Taxes	-0.108 (0.128)	-0.067 (0.102)	-0.257 (0.222)	-0.015 (0.079)	-0.028 (0.113)	0.037 (0.115)	-0.122 (0.149)	-0.072 (0.119)	0.035 (0.144)	0.158 (0.148)
Creditors' Equity	-0.120 (0.142)	-0.138 (0.097)	-0.299 (0.199)	-0.015 (0.060)	0.050 (0.072)	0.014 (0.104)	-0.132 (0.138)	0.104 (0.148)	0.156 (0.112)	0.024 (0.124)
Owner's Equity	-0.055 (0.146)	0.032 (0.088)	-0.285 (0.190)	0.067 (0.070)	0.075 (0.083)	0.059 (0.097)	-0.035 (0.147)	0.051 (0.176)	0.083 (0.133)	0.177 (0.125)
ROA	0.095 (0.291)	-0.0005 (0.319)	0.391 (0.502)	-0.590** (0.290)	0.221 (0.365)	-0.075 (0.293)	0.133 (0.440)	-0.282 (0.337)	0.131 (0.350)	-0.083 (0.358)
Indebtedness	-0.364** (0.155)	-0.021 (0.103)	0.167 (0.119)	0.181* (0.100)	-0.162 (0.128)	-0.316*** (0.117)	-0.005 (0.109)	-0.201 (0.166)	-0.094 (0.161)	-0.217 (0.161)
Size	0.203*** (0.034)	0.152*** (0.033)	0.104* (0.055)	0.057* (0.031)	0.003 (0.036)	0.210*** (0.028)	0.129*** (0.044)	0.090** (0.042)	0.099*** (0.036)	0.071** (0.034)
Fixed effects of company	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects of time	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered robust errors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	782	782	782	782	782	782	782	782	782	782
R <sup>2</sup>	0.276	0.240	0.086	0.180	0.049	0.235	0.085	0.164	0.073	0.070
Adjusted R <sup>2</sup>	0.140	0.096	-0.087	0.026	-0.131	0.090	-0.088	0.006	-0.102	-0.106
F-Statistic	13.212***	10.891***	3.240***	7.605***	1.779**	10.603***	3.204***	6.776***	2.706***	2.598***

Note. \*p < 0.1; \*\*p < 0.05; \*\*\*p < 0.01

## 5 CONCLUSION

This study aimed to investigate how the VAS may contribute as a source of financial information disclosure with a social objective compared to broad ESG measures. For this, it was analyzed how the ESG metric provided by Refinitiv Eikon correlated with the value added distributed by the Brazilian companies listed on B3 from 2010 to 2022.

As the main results of the factor analysis, this research identified that the Governance pillar had more information in common with the value-added distribution categories, while the Environmental and Social pillars formed a separate factor, not sharing similarities with the VAS.

However, once controlled for company profitability, indebtedness, and size (regression analyses), the relationship between the ESG pillars and the VAS variables changed. Only the Environmental pillar showed a positive correlation with the value-added distribution variables, more specifically, the level of distribution of creditors' equity, which is negatively associated with the environmental score. No other statistically significant relationship was found. This indicates that the information contained in the VAS, being of financial origin, needs to be complemented with the information contained in the ESG scores, which are of different natures.

As suggestions for future research, we indicate investigating whether other ESG metrics (from other sources) have similar behaviors relative to the value-added categories of the VAS. In addition, we suggest including voluntary information (such as carbon emissions) to increase the predictive power of the models.

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