Original Paper

# Does the disclosure tone matter? An analysis of the CSR disclosure tone effects on firm performance

**O tom da divulgação importa? Uma análise dos efeitos do tom do disclosure de RSC no desempenho das firmas**

**¿Importa el tono de la divulgación? Un análisis de los efectos del tono de divulgación de RSC en el desempeño de la empresa**

**Dermeval Martins Borges Júnior**
Doutor em Ciências Contábeis (UFU)
Doutorando em Administração pelo PPGA/FAGEN (UFU), Uberlândia/MG, Brasil
dermevaljr14@hotmail.com
https://orcid.org/0000-0003-2279-449X

**Rodrigo Fernandes Malaquias***
Doutor em Administração de Empresas pela EAESP (FGV)
Professor Associado (UFU), Docente Permanente do PPGA/FAGEN (UFU), Uberlândia/MG, Brasil
rodrigofmalaquias@yahoo.com.br
https://orcid.org/0000-0002-7126-1051

**Address of primary contact for correspondence***
Av. João Naves de Ávila, 2121, Bloco F, Sala 1F-216, Santa Mônica, CEP: 38.400-902, Uberlândia/MG, Brasil

**Abstract**
The aim of this paper is to examine the effects of CSR disclosure tone, in the environmental, social and economic dimensions, on the performance of Brazilian listed companies. The final sample included financial data from 219 different Brazilian listed companies and 1,797 corporate reports from 2010 to 2019. The data were analyzed by using descriptive statistics and regression models with panel data. The results of this research demonstrated that the prevalence of optimistic CSR information, presented in the reports, implies better market value index, as well as a reduction in the cost of capital. Thus, there is the need to consider the disclosure tone and CSR topics when assessing the CSR disclosure and its effect on performance, therefore advancing in relation to studies that are based on a simple observation of whether a report or subject should be published in the documents.
**Keywords:** social responsibility; firm performance; corporate finance; environment and development; sustainability

**Resumo**
O objetivo deste trabalho é examinar os efeitos do tom do *disclosure* de RSC, em suas dimensões ambiental, social e econômica, no desempenho das companhias abertas brasileiras. A amostra final contemplou dados financeiros e 1.797 reportes corporativos, provenientes de 219 companhias abertas brasileiras distintas no período de 2010 a 2019. Os dados foram analisados a partir de estatísticas descritivas e aplicação de modelos de regressão com dados em painel. Os resultados desta pesquisa demonstram que informações de RSC otimistas apresentadas nos relatórios implicam em melhores índices de valor de mercado, bem como na redução do custo de capital. Assim, verifica-se a necessidade de se considerar o tom empregado na publicação e os tópicos que compõem a RSC na avaliação do *disclosure* de RSC e seu efeito no desempenho, avançando em relação aos estudos que se baseiam na simples observação da publicação ou não de determinado relatório ou assunto nos documentos.
**Palavras-chave:** responsabilidade social; desempenho da firma; finanças corporativas; ambiente e desenvolvimento; sustentabilidade

**Resumen**
El objetivo de este trabajo es examinar los efectos del tono de divulgación de la RSC, en sus dimensiones ambiental, social y económica, sobre el desempeño de las empresas cotizadas brasileñas. La muestra final incluyó datos financieros de 219 diferentes sociedades cotizadas brasileñas y 1.797 informes corporativos en el período comprendido entre 2010 y 2019. Los datos se analizaron utilizando estadísticas descriptivas y modelos de regresión con datos de panel. Los resultados de esta investigación demuestran que la

prevalencia de información de RSC optimista, presentada en los informes, implica en mejores índices de valor de mercado, así como una reducción en el costo de capital. Así, surge la necesidad de considerar el tono utilizado en la publicación y los temas que componen la RSC en la evaluación de la divulgación de la RSC y su efecto en el desempeño, avanzando en relación a los estudios que se basan en la simple observación de la publicación o no de un informe o tema particular en los documentos.
**Palabras clave:** responsabilidad social; resultados de la empresa; finanzas corporativas; medio ambiente y desarrollo; sostenibilidad

## 1 Introduction

The voluntary disclosure theory, also known as the disclosure theory, whose initial models stem from Verrecchia (1983) and Dye (1985), has as its basic assumption that information represents a signal that reveals the intrinsic value of a particular risk asset affected by some noise (e.g., informational asymmetry). In the case of a voluntary disclosure, a manager's decision on whether to make the information public will depend on its implications for the asset value. Therefore, based on the voluntary disclosure theory, it is plausible to assume that the effect of disclosure on firm performance is influenced by the tone adopted in communication. This means that good news would be associated with superior firm performance as the opposite of bad news. As the assumptions of voluntary disclosure theory are founded on voluntary financial information, the predominant approach in researches on disclosure tone involves such kind of information (Loughran & Mcdonald, 2016).

However, voluntary disclosure does not merely refer to non-mandatory financial information. Usually, depending on the country institutional characteristics, the Corporate Social Responsibility (CSR) disclosure constitutes a discretionary information disclosure, with the exception of some market sectors whose activities have negative socio-environmental impacts (e.g., Brazilian companies from the electricity industry, due to determination of the National Electric Energy Agency - ANEEL, must disclose socio-environmental information). Therefore, CSR information may also contribute to understanding the disclosure tone and its possible implications for the firm's performance.

Over the past five years, some researches on the relationship between CSR disclosure and firm performance began to incorporate specific analyses involving CSR dimensions. For example, Verbeeten, Gamerschlag and Möller (2016) verified the existence of a positive relationship between social information disclosure and stock prices, although this result did not hold for environmental disclosure. These findings were partially corroborated by Mittelbach-Hörmanseder, Hummel and Rammerstorfer (2021); the difference was that the relationship between environmental disclosure and stock price was negative. Finally, Wasara and Ganda (2019) found similar results for firms' return rates, i.e., a positive relationship between social disclosure and profitability, whereas the effect of environmental disclosure on profitability was the opposite.

Despite the fact that literature advances arise from studies in this regard, such as the ones by Verbeeten, Gamerschlag and Möller (2016), Mittelbach-Hörmanseder, Hummel and Rammerstorfer (2021) and Wasara and Ganda (2019), there still seems to be room for the identification of the elements of CSR disclosure that have the greatest impact on the firm's performance metrics. This occurs because such studies are fundamentally centered on environmental and social disclosure, thus not involving other components of CSR, such as the economic dimension, and mainly the disclosure tone, that is, whether the published information is optimistic or pessimistic.

Bearing in mind that the disclosure theory assumes that the decision to whether disclose or withhold a voluntary information is influenced by the economic effects resulting from this disclosure (Verrecchia, 1983; Dye, 1985), thus suggesting that either good or bad news could impact firm performance in different ways, and also considering that CSR activities affect performance depending on their respective dimension that was observed (Carroll & Shabana, 2010), the following research problem arises: what are the effects of CSR disclosure tone, in the environmental, social and economic dimensions, on the performance of Brazilian listed companies performance? Therefore, the main purpose of this study is to examine the effects of CSR disclosure tone, in the environmental, social and economic dimensions, on the performance of Brazilian listed companies.

This research is justified as it considers either the optimistic or the pessimistic perspective that predominates in the corporate reports as well as the CSR issues that are highlighted in them. As a result, we estimated variables that portray the disclosure of environmental, social and economic aspects and their positive or negative tones based on the textual analysis of 1,797 corporate reports. Therefore, this research represents an advance regarding previous studies that observed CSR disclosure through the use of a general index or dummy variables of whether a corporate report has been published, such as the ones by Dhaliwal, Li, Tsang and Yang (2014), Plumlee, Brown, Hayes and Marshall (2015), Novaes and Almeida (2021), among others.

In addition, the current study advances by considering the classifications of CSR aspects that are evidenced in terms of their nature (positive, neutral and negative) and their environmental, social and economic dimensions in the analysis of CSR disclosure from an emerging economy perspective. Dhaliwal et al. (2014) and Cahan et al. (2016) have shown that country characteristics influence the relationship between CSR disclosure and firm performance. Abu Qa'dan and Suwaidan (2019) state that the main studies about the subject usually include only companies from developed countries in their sample. Thus, it is desirable that the evidence that has been documented in the literature should be tested in emerging economies in order to enable comparisons between developed and developing countries.

Finally, this research also proposes the use of a dictionary in the Portuguese language, which makes it possible to estimate CSR disclosure, including environmental, social and economic topics, as well as the positive, neutral or negative tones that are adopted, based on the frequency analysis of the words listed on the instrument and observed in the corporate reports. Although previous studies have developed and applied dictionaries to measure disclosure in financial reports (Henry & Leone, 2016; Loughran & Mcdonald, 2016), none of them has included terms and expressions related to CSR disclosure. In addition, since those dictionaries are made in foreign languages, it is difficult to conduct their application in the Brazilian context, because most corporate reports in Brazil are written in Portuguese.

It should be mentioned that the use of dictionaries to assess CSR disclosure, including both disclosure tone and its impact on firm performance, constitutes an innovative approach in the Brazilian literature on the topic. The reason is that CSR disclosure is usually examined by the dichotomous verification of whether a corporate report has been published by an index based analysis of the subjects that are disclosed in the documents. For example, Borges Junior (2019) studied the association between sustainability report disclosure and firms' performance, in which the disclosure was measured through a dummy variable receiving value 1 for firms that disclosed a sustainability report and 0 otherwise. In the same way, Burgwal and Vieira (2014) investigated the determinants of environmental disclosure level, and their analysis was based on an instrument in which they assigned either 0 or 1 values for several sentences that refer to the disclosure items.

## 2 Literature Review and Hypothesis Foundation

According to the voluntary disclosure theory, whose bases are attributed to Verrecchia (1983) and Dye (1985), for the firm to disclose voluntary information**,** such as the CSR ones, these must imply some relevant economic effect. This occurs because information reveals the intrinsic value of a risk asset, although its disclosure implies some costs. Thus, the manager decides whether to disclose a voluntary information depending on its outcome economic effect that it is expected to have on the firm. Given this, it is understood that managers hold considerable CSR information, but tend to publicize fundamentally those that may bring economic benefits to the company.

Balabanis, Phillips and Lyall (1998) state that CSR disclosure has a positive effect on profitability because this information is necessary for stakeholders to assess the firm's long-term prospects, including its socio-environmental performance. According to Balabanis, Phillips and Lyall (1998), some researchers may argue the opposite, that is to say that CSR activities and their disclosure erode profitability due to the fact that initiatives of this nature, such as donations to charitable institutions, support for charitable projects, use of environmentally correct equipment and materials, among others, imply additional costs. Despite such fact, Balabanis, Phillips and Lyall (1998) assert that this kind of view is limited as it does not contemplate the possible economic benefits that arise from good socio-environmental conduct and that it neglects negative impacts on profitability that result from an unfavorable socio-environmental posture.

Previous studies have shown that a positive disclosure tone is positively associated with firm profitability (Davis, Piger & Sedor, 2012; Huang, Teoh & Zhang, 2014). Davis, Piger and Sedor (2012) observed that an optimistic tone in earnings release communications is positively associated with firm profitability in subsequent quarters. Davis, Piger and Sedor (2012) argue that this occurs because managers use a positive tone when communicating results as a voluntary disclosure mechanism, which signals the information credibility regarding any future performance. Davis, Piger and Sedor (2012) point out, however, that this only applies when managers have incentives to sincerely publish information, i.e., it depends on the costs and benefits of applying a true disclosure strategy when it is compared to a false one.

As for the evidence strictly concerning the CSR disclosure tone, although there are no studies that consider its environmental, social and economic dimensions in depth, there are findings referring to positive environmental performance, its disclosure and its effect on profitability. Carè and Forgione (2019) analyzed the relationship among environmental disclosure, environmental performance and profitability of 57 banks in the European Union. Carè and Forgione (2019) showed that when the firm has a favorable environmental performance and it highlights information in this regard, there is an increase in its return on assets rate for the period. Carè and Forgione (2019) argue that this superior profitability comes from improved reputation that the firm acquires by presenting good environmental conduct and also by reducing financing costs, when demonstrating investments in CSR areas. In light of the foregoing, we propose the following hypothesis:

**$H_1$:** The positive (negative) disclosure tone has a positive (negative) effect on firm profitability.

Yekini, Wisniewski and Millo (2016) state that the positive tone adopted in the firms' reports exerts a market response. According to Yekini, Wisniewski and Millo (2016), this happens because investors, when analyzing published reports, are persuaded by the narratives employed by firms, which affect their decisions to apply resources. From the perspective of the Elaboration Likelihood Model (ELM), a theoretical model in the field of experimental psychology, Yekini, Wisniewski and Millo (2016) argue that the more positive expressions are used in reports, the greater the market reaction will be to those narratives and, consequently, the effect on firm economic performance.

It should be mentioned that the nature of the disclosure, i.e., whether good or bad news is published, may also affect the relationship between CSR disclosure and market value. According to Rogers, Buskirk and Zechman (2011), the optimistic tone adopted in the voluntary disclosure of information raises investors' expectations regarding firm value, by positively impacting its share prices, and it could even increase its litigation risk in cases in which the positive information that is shown is incompatible with reality.

Specifically within the scope of CSR disclosures, Du and Yu (2020) found that the use of an optimistic tone associated with the intelligibility of CSR reports is positively related to firms' socio-environmental performance, which generates favorable market reactions, i.e., improvements in the level of share return and trading volume. Sarumpaet, Nelwan and Dewi (2017) found evidence that high levels of firms' environmental performance are associated with higher share prices, whereas low environmental performance proves to be irrelevant to the market. Additionally, Plumlee et al. (2015) demonstrated that positive environmental disclosure is positively associated with firm value. Therefore, it is assumed that information tone regarding CSR dimensions may also affect the firm's stock price, which leads to the hypothesis as follows:

**$H_2$:** The positive (negative) disclosure tone has a positive (negative) effect on the firm value.

From the voluntary disclosure theory perspective, Verrecchia (1983) and Dye (1985) propose that the decision to voluntarily disclose information should involve analyzing the economic effects generated from its publication. If the understanding that the disclosure of any information implies higher costs than benefits on the managers' part occurs, the tendency is for the information to be withheld or for its disclosure to be postponed as much as possible. For this reason, the approach derived from Verrecchia (1983) and Dye (1985) makes us assume that the negative information disclosure would increase the cost of capital, whereas positive information would have the opposite effect.

According to Kim and Shi (2011), and consistent with the voluntary disclosure theory, profit forecasts made by managers and voluntarily disclosed by the firm, when they are negative, are associated to cost of capital increases in the month immediately following the disclosure. On the other hand, in cases where the estimates of future earnings are favorable, Kim and Shi (2011) documented a reduction in the cost of capital, but the effects were not as immediate and significant as it was verified with negative forecasts. Kim and Shi (2011) presented some reasons to justify the relationship between the disclosure nature (good or bad news) and the firm cost of capital. One of them is that favorable information may reassure investors about uncertainties whereas unfavorable information causes concerns about the future.

There is no evidence in the literature regarding the effect of CSR disclosure tone and its dimensions on cost of capital. However, these aspects began to receive more attention, so that specific researches in this direction began to appear. For example, Plumlee et al. (2015) and Virtania and Siregar (2017), among other points, examined the relationship between the nature (positive, neutral or negative) of voluntary environmental disclosure (i.e., without taking other CSR dimensions into account, such as the social and economic ones) and the cost of capital. In those studies, Plumlee et al. (2015) and Virtania and Siregar (2017) observed that when the disclosure is classified according to the positive, neutral or negative nature, its effect on cost of capital is more easily identified.

Thus, we conjectured that the information nature has a distinct impact on cost of capital, e.g., the disclosure of information assessed as a positive one could reduce the cost of capital whereas a negative one would have a positive effect:

**$H_3$:** The positive (negative) disclosure tone has a negative (positive) effect on cost of capital.

## 3 Methodology

### 3.1 Sample definition

Initially, it should be understood that this research has two samples for different purposes. One of them refers to the companies whose reports were considered in the elaboration of the dictionary for measuring CSR disclosure and its dimensions. And the other refers to the companies that were considered for the application of the developed dictionary in order to achieve the objective of examining the effects of CSR disclosure tone, in the environmental, social and economic dimensions, on the performance of Brazilian listed companies.

In order to compose the sample referring to the dictionary elaboration, the starting point was the firms' population whose CSR reports were available in the Global Reporting Initiative (GRI) database at the moment of the data collection. The sample was based on accessibility, by considering all Brazilian companies with available CSR reports in the GRI database from 2010 to 2018. It should be mentioned that, for the dictionary creation, all types of firms were contemplated, i.e., any size of firms (small and medium, large or multinational) from all sectors.

The choice for all companies, without any discrimination regarding their characteristics, was made to meet the criteria required when creating a list of words to measure disclosure, especially the aspects of relevance (i.e., to consider documents that present congruent contents about the subjects measured by the dictionary) and completeness (i.e., by contemplating documents in sufficient quantity to create a dictionary) (Deng, Hine, Ji & Sur, 2017). In this way, 359 companies composed the sample for the dictionary elaboration, thus totaling 1,371 reports from 2010 to 2018.

With the purpose of directly achieving the study objective, the starting point was the population composed of all Brazilian companies listed on the Brazilian Stock Exchange (Brasil, Bolsa, Balcão – B3) that disclosed a management report or CSR report with available data for the examined variables from January 2010 to December 2019. The year of 2010 was chosen as the initial period due to the greater availability of reports with CSR information when it was compared to previous years, according to a study by KPMG (2018). The year of 2019 was selected to represent the end of the sample period because it was the last year with available data, up to the time of the data collection.

Therefore, from the Brazilian Securities Commission (CVM) website, the management reports of all Brazilian listed companies from 2010 to 2019 were collected, which totaled 4,099 management reports. With regard to CSR reports, these were collected from the GRI database for the same period, resulting in 851 CSR reports. In view of this, in order to examine the relationship between the CSR disclosure tone and the firm performance, 4,950 corporate reports were considered, including management reports and CSR reports. In addition to corporate reports, we collected financial data to estimate other variables, such as performance measures and firm characteristics. These data were obtained from the Economatica database for the same period.

It was found that the Economatica database did not present data for some companies in a given year, thus resulting in the existence of missing values in the database. This situation, if it is left untreated, could lead to problems in the analysis aiming at the study objective, in the sense that it would lead to the result comparison among different performance measures with different samples. In view of the above, and as a way of homogenizing the samples for all estimated models, the observations that showed a missing value for any of the studied variables were removed. Another exclusion that occurred in the database refers to observations with negative net worth for those variables whose calculation involved such net worth.

After having made the exclusions, the final sample by accessibility had 1,270 company-year observations. We understand that the deletions do not compromise the analyses, since the number of the remaining observations continued high. Consequently, the total number of firms that made up the final sample was 219 Brazilian listed companies. Table 1 presents a comparison between the two samples.

Table 1
**Comparison between the samples that are considered in this study**

<table>
<tr><th colspan="3">Sample for the CSR dictionary elaboration</th></tr>
<tr><th>Firms</th><th>Reports</th><th>Period</th></tr>
<tr><td>359 firms</td><td>1,371 CSR reports</td><td>2010 – 2018</td></tr>
<tr><th colspan="3">Population for analysis of the relationship between CSR disclosure and performance</th></tr>
<tr><th>Firms</th><th>Reports</th><th>Period</th></tr>
<tr><td rowspan="2">501 firms</td><td>4,099 management reports</td><td rowspan="2">2010 – 2019</td></tr>
<tr><td>851 CSR reports</td></tr>
<tr><th colspan="3">Final sample after removing observations with missing values and negative net worth</th></tr>
<tr><th>Firms</th><th>Reports</th><th>Period</th></tr>
<tr><td rowspan="2">219 firms</td><td>1,314 management reports</td><td rowspan="2">2010 – 2019</td></tr>
<tr><td>483 CSR reports</td></tr>
<tr><td>Firm-year observations</td><td></td><td>1,270</td></tr>
</table>

Source: by the authors

### 3.2 CSR dictionary elaboration

Loughran and Mcdonald (2016) state that a procedure that is employed in order to measure the textual content of report disclosure consists in reducing the document to a matrix composed of a few words and their respective occurrence frequencies for each report. In this way, it would be possible to synthesize the analysis of extensive reports, by considering that counting the occurrence of words in a document is an easy task for computers. Some previous studies in finance used word counts to measure disclosure. For example, Elshandidy, Fraser and Hussainey (2013) investigated the impact of corporate risk levels on risk disclosure in annual reports based on word count related to risk. Merkley (2014) examined the relationship between research and development (R&D) disclosure and performance, by measuring disclosure through a list with keywords in the context of R&D. Finally, Yekini, Wisniewski, and Millo (2016) analyzed the market reaction to the positivity in annual reports based on the frequency of positive words.

In oder to measure the CSR disclosure variables, we conducted a textual analysis of the reports based on a dictionary elaboration, i.e., we created a list of words. Loughran and Mcdonald (2016) point out some advantages of using dictionaries for document analysis. The first advantage is that, when using a list of words, the researcher's subjectivity is minimized, since there is no attribution of grades or weights for the subjects that are disclosed in the reports. Another benefit is that dictionaries make it possible to explore large samples and dense documents, because word frequencies can be tabulated by using computers. Finally, with the availability of word lists, future studies may easily replicate or establish comparisons with the analyses carried out in previous studies, hence corroborating or refuting their results.

According to Deng et al. (2017), the first step is to define the corpus when creating a dictionary, i.e., the source of documents from which the list will be developed. According to Loughran and McDonald (2016) and Deng et al. (2017), there is no consensus on the criteria to be observed when defining the corpus, but three basic characteristics must be considered, namely: relevance, adequacy and completeness. The corpus must be relevant in the sense of covering contents that are consistent with the subject of the word list that will be created (Deng et al., 2017). With regard to adequacy, the corpus should be based on texts rather than on images or on numbers, given that its purpose is textual analysis (Deng et al., 2017). Finally, the corpus should be complete in order to include enough documents for the list development (Deng et al., 2017).

In order to define the word list, all CSR reports from the GRI base with filter for Brazil were collected from 2010 to 2018, which totaled 1,371 reports. The choice of all available reports, and not merely those published by Brazilian listed companies, which comprise the sample of this study, was due to the achievement of the completeness corpus criterion when developing a dictionary. In addition, given that the objective of the initial analysis was the dictionary creation to be employed in the estimation of CSR disclosure, the choice of documents was focused on their textual content, by disregarding elements such as figures, graphs, among similar ones.

With the documents in hand, the next step consists in processing the textual content. According to Deng et al. (2017), the document processing involves preparing the corpus for further analysis and coding as well as excluding words or expressions based on a cut-off criteria. In order to be able to identify the terms that are common to the CSR reports and to elaborate a word list that is consistent with the document contents, we estimated the consolidated frequencies of all words that were written in the reports.

The sum of the frequencies totaled 27,054,532 words for all 1,371 reports, of which 243,893 corresponded to different words. Due to the high number of identified words, it was necessary to exclude those with low occurrence. As a cutoff criterion, Lesage and Wechtler (2012) and Debortoli, Muller and Brocke (2014) removed terms whose frequency was less than 1%. Despite this, in order to create an accurate dictionary and to avoid undue exclusion of relevant terms, the cut-off criterion that was adopted in this research was 0.01%. Therefore, words whose frequency in relation to the total was less than 0.01% were removed, thus leaving 2,952 remaining words.

The terms that comprise the dictionary strictly followed the word frequency analysis of the reports and the cut-off criteria that have been explained; they involved nouns, adjectives, verbs and adverbs, regardless of their inflections. This means that additional terms to the most prevalent ones that had been observed in the documents were not included, not even radicals as a way of covering all derivatives of any word. For example, the words “trabalhadores” (workers) (0.01%), “trabalhar” (to work) (0.01%), “trabalhistas” (labor aspects) (0.02%), “trabalho” (work/singular) (0.13%) and “trabalhos” (work/plural) (0.01%) composed the dictionary, as they met the cut-off criterion of up to 0.01% frequency, whereas the words “trabalhador” (male worker) and “trabalhadora” (female worker) did not present any sufficient frequency and, therefore, were removed.

The third step in the dictionary creation process is categorization. According to Weber (1983), a category is a set of words that share similar meanings or connotations. Weber (1983) cites the example of the terms “banker”, “money” and “mortgage”, which could be classified in categories such as “wealth” or “economy”. In this study, two criteria based on the CSR dimensions and on the disclosure tone were established in order to define the categories.

With regard to the CSR elements, the major categories of the GRI standards were considered, namely: environmental, social and economic ones. This choice was made because the GRI is among the most used models in the voluntary CSR information disclosure in Brazil (Crisóstomo, Forte & Prudêncio, 2020). As for the categories related to the disclosure tone, we followed the classification by Plumlee et al. (2015) for positive, neutral and negative terms.

After having established the categories, we classified the words in them. According to Deng et al. (2017), in this step, the researcher evaluates each word in the generated list and he/she determines whether the term should be kept and in which category it should be allocated. Based both on its meaning and connotation, each term was categorized according to the CSR dimension at GRI (environmental, social or economic one) and according to its nature (positive, neutral or negative). No word was classified in more than one category for a CSR dimension or disclosure nature.

In such categorization process, some words (articles, conjunctions, prepositions) were not classified and, therefore, they were excluded from the dictionary. Terms in other languages were also removed to avoid duplicate counts that could compromise the analyses, because some reports disclose the same information in different languages. The total number of excluded terms was 1,885, which corresponds to 63.85% of the remaining words after the 0.01% cut-off criterion. Table 2 presents the number of words according to the categorization.

Table 2
**Number of complete words according to categorization**

| Tone / CSR | Environmental | Social | Economic | Total |
|---|---|---|---|---|
| Positive | 45 | 271 | 120 | 436 |
| Neutral | 41 | 177 | 324 | 542 |
| Negative | 29 | 26 | 34 | 89 |
| Total | 115 | 474 | 478 | 1,067 |

Source: by the authors.

Based on the word frequency in each category in the CSR reports of the companies that comprise the current research sample, the disclosure variables were estimated, which will be detailed in the next subsection. The word frequency in the reports was obtained by using the WordStat 8 software, trial version.

### 3.3 Variable description

In order to investigate the relationship between disclosure tone and firm performance, we considered measures for the firm performance based on profitability, cost of capital and market value as dependent variables. It should be mentioned that, since the report for year *t* is normally published in the first quarter of *t+1,* the dependent variables of this research are found in *t+1*, whereas the independent ones are in *t*.

According to Wasara and Ganda (2019), the most prevalent measure in studies that associated profitability with firm information disclosure is the return on assets. Thus, the return on assets (ROA) was used in this study to measure the firm's profitability. The variable was calculated by using the operating profit at the end of the period divided by the total assets of the previous year.

As to firm value, we employed the natural logarithm (LN) of market capitalization, i.e., the company's share price multiplied by the number of outstanding shares. We use market capitalization in natural logarithm because it constitutes a more useful scale for economic data evaluation, especially in the case of large numbers. According to Gelman and Hill (2007), the use of the logarithmic scale facilitates interpretations in linear regression models, as it considers proportionalities in the differences. For example, for a coefficient of 0.05, a difference of 1 in a certain explanatory variable *x* corresponds to a 6% difference in the response variable *y*.

Specifically for the firm value variable, it should be mentioned that we considered the market capitalization on March 31 of each sample year, unlike the other dependent variables, whose reference date was December 31. This choice was made to better capture the effect of CSR disclosure on firms' value, as corporate reports are usually published by the end of the third month of the subsequent year after the end of the previous fiscal year.

Finally, the last dependent variable was the cost of capital. Previous studies have considered it in the disclosure analysis, such as the ones by Dhaliwal et al. (2011), Dhaliwal et al. (2014) and Plumlee et al. (2015). In order to measure the cost of capital, to cover both the cost of equity capital and the cost of third-party capital, the weighted average cost of capital (WACC) was considered as the dependent variable. The cost of equity capital was measured by the CAPM and the cost of third-party capital was obtained by dividing the financial expenses in the reference year for the average of loans and financing in the previous year.

As independent variables of interest, so as to measure the CSR disclosure tone, we established proxies for information disclosure of the major topics that are covered by the GRI standards (environmental, social and economic ones) together with the positive, neutral or negative tones. The estimation of these variables was based on the word frequency of the dictionary, whose elaboration had been discussed.

Subsequently, we estimated the variables for each CSR dimension, whose calculation was performed through the difference between the relative frequency of positive and negative words in the reports, for each CSR category of the dictionary:

$$Disclosure\ tone = \frac{\sum Fp_{ij}}{Np} - \frac{\sum Fn_{ij}}{Nn}$$

Where:
$Fp_{ij}$ = frequency of positive words in the report of firm *i* in year *j* from the respective dictionary category;
$Np$ = number of positive words from the respective dictionary category;
$Fn_{ij}$ = frequency of negative words in the report of firm *i* in year *j* from the respective category in the dictionary;
$Nn$ = number of negative words from the respective dictionary category;

Such procedure was based on the discussions that were presented by Henry and Leone (2016), specifically concerning the indication of the disclosure tone net score, i.e., the difference between the frequency of positive and negative words in the reports, divided by the number of positive and negative words in the dictionary, to determine whether a particular firm adopted an optimistic or a pessimistic tone in its publication.

We used some measures related to the general CSR disclosure and, specifically, to the environmental, social and economic dimensions as control variables, which were denoted as discRSC, discENV, discSOC, discECO, respectively. The inclusion of CSR disclosure and its dimensions as control variables was due to previous studies that demonstrate its relevance to explain variations in profitability (Yusoff, Mohamad & Darus, 2013; Bidhari et al., 2013; Kamatra & Kartikaningdyah, 2015), market value (Dhaliwal et al., 2011; Cahan et al., 2016; Mittelbach-Hörmanseder, Hummel & Rammerstorfer, 2021) and cost of capital (Reverte, 2012; Li & Foo, 2015; Li & Liu, 2018). This occurs because the information provided by the firm can lead to stakeholders' initiatives that impact its performance.

The calculation of these variables involved the sum of word occurrences in both management and CSR reports divided by the number of words corresponding to each category in the dictionary. For example, the dictionary has 115 words for the environmental category, thus the environmental disclosure indicator value for a company was obtained through the word frequency of the environmental topic in the report divided by 115.

With the disclosure indices in hand, we estimated the dummy variables, in which value 1 was assigned to those firms whose disclosure score was equal to or greater than the median of the relative keyword frequency and value 0 otherwise in each year. This procedure aimed to identify the firms that showed more CSR information when compared with the others (Muttakin & Subramaniam, 2015).

The other control variables were also defined: i) *TotalAsset*: *proxy* for firm size, measured by using the natural logarithm of total assets at the end of each year (12/31); ii) *Leverage*: firm financial leverage, measured from the ratio between the average onerous liability and the average market value in the year; iii) *Vol_ROA*: return on assets volatility, measured from the return on assets standard deviation in the last three years prior to the observed period; iv) *Growth*: growth perspective, measured by the difference between the current and the previous year sales revenue, divided by the sales revenue of the previous year. Controls were also made per industry and per year.

### 3.4 Analysis procedures

We used descriptive statistics (mean, standard deviation, minimum and maximum values for each variable) and panel data regression models to analyze the database. There are some cases of missing values for some firms over time; therefore, an unbalanced panel data was adopted. The generic econometric model for the quantitative tests is given by:

$$Performance_{i,t+1} = \beta_{i0} + \beta_1 CSR\_Disclosure_{i,t} + \gamma Control_{i,t} + \varepsilon_{i,t}$$

Where:
$Performance_{i,t+1}$ represents the performance of firm *i* in year *t+1*;
$CSR\_Disclosure_{i,t}$ represents the variables for environmental, social and economic disclosure tones in the reports of firm *i* in year *t*;
$Control_{i,t}$ represents control variables related to characteristics of firm *i* in year *t*;
$\beta_0$ is the intercept of the model;
$\beta_1$ and $\gamma$ are the coefficients for the variables of interest and control variables, respectively;
$\varepsilon_{i,t}$. is the error term.

In order to avoid endogeneity concerns that arise from the correlation between the explanatory variables and the individual effects of the sample observations, all models were estimated by using fixed effects. According to Fávero and Belfiore (2017), the estimation of fixed effects allows the treatment of a limited form of endogeneity, due to the fact that the parameters referring to the individual effects in the intercept, which may be correlated with the explanatory variables, are eliminated. Furthermore, by observing procedures that were adopted in a previous research (Li et al., 2018), in a robustness analysis, the models were estimated again through two-stage least squares (Greene, 2012), by using the disclosure tone lagged by one period as an instrumental variable.

In order to deal with problems that arise from heteroscedasticity and autocorrelation, the models were estimated with robust standard errors. The outliers were treated by using the winsorize procedure up to the limit of 0.025. The Variance Inflation Factor (VIF) was used as a way of verifying whether the models that were estimated in the research are subject to multicollinearity problems.

# 4 Results

## 4.1 Descriptive statistics

Table 3 presents the descriptive statistics (mean, standard deviation, minimum and maximum) for the variables of the study. It indicates that the companies of the sample had, on average, a return on assets (ROA) of 6.21%, thus suggesting positive average profitability in the period, although the dispersion of values was considerable (from -18.90 % to 26.70%). With regard to the natural logarithm of market value, the average was 14.95, with a minimum value of 8.25 and a maximum value of 20.30. Finally, for the cost of capital, the last variable among those considered as performance measures, on average the weighted average cost of capital was 14.00% per year, dispersed between the minimum value of 2.44% and the maximum value of 35.03% per year.

Table 3
**Descriptive Statistics**

| Variables | Obs. | Avg. | S.D. | Min. | Max. |
|---|---|---|---|---|---|
| ROA | 1,270 | 0.0621 | 0.0892 | -0.1890 | 0.2670 |
| Market Value | 1,270 | 14.9491 | 1.9359 | 8.2516 | 20.2971 |
| WACC | 1,270 | 0.1400 | 0.0776 | 0.0244 | 0.3503 |
| toneRSC | 1,270 | 0.0853 | 0.5267 | -1.0952 | 1.5225 |
| toneENV | 1,270 | 0.3212 | 1.2191 | -1.5303 | 4.8287 |
| toneSOC | 1,270 | 0.5214 | 0.6106 | -0.4229 | 2.4935 |
| toneECO | 1,270 | 0.1707 | 0.9015 | -2.0534 | 2.3787 |
| discRSC | 1,270 | 2.2788 | 2.6935 | 0.0637 | 10.7816 |
| discENV | 1,270 | 2.3474 | 3.1873 | 0.0261 | 12.9565 |
| discSOC | 1,270 | 1.6501 | 2.2090 | 0.0316 | 8.9030 |
| discECO | 1,270 | 2.8997 | 3.2083 | 0.0941 | 13.3828 |
| TotalAssets | 1,270 | 15.6575 | 1.4683 | 12.2450 | 18.5850 |
| Leverage | 1,270 | 1.1951 | 1.8398 | 0.0166 | 9.2002 |
| Vol_ROA | 1,270 | 0.0489 | 0.0608 | 0.0034 | 0.3210 |
| Growth | 1,270 | 0.0406 | 0.2697 | -0.6240 | 0.8920 |

Notes: as explained in the method section, the dependent variables of this research are found in “t+1”, whereas the independent variables are in “t”, thus, the dependent variables refer to the measures of performance from 2011 to 2019, whereas the independent ones refer to the disclosure and characteristics of the companies from 2010 to 2018.
Source: by the authors.

In accordance with Table 3, it is noticed that the reports that are considered in the sample, on average, presented words that refer to corporate social responsibility in 2.28 times the amount of keywords in the dictionary for the respective category (1,067). The prevalence was of informational content of the economic dimension (average of 2.90 for relative frequency), followed by the environmental (average of 2.35) and social ones (average of 1.65). Despite such fact, it appears that there is considerable dispersion in the scope of CSR disclosure of Brazilian listed companies.

For example, the company with the highest level of CSR disclosure had a relative frequency of words related to the subject of 10.78, whereas the index for the company with the lowest level of disclosure was 0.06; it can also be observed from the standard deviation for CSR disclosure index (2.69). These same results apply when the CSR dimensions are seen separately, as a similar dispersion was observed for environmental (standard deviation of 3.19), social (standard deviation of 2.21) and economic (standard deviation of 3.21) disclosures.

Regarding the disclosure tone, a prevalence of optimistic information in relation to the pessimistic one in the reports was observed for each CSR dimension, on average, as the averages for the indices of the disclosure tone were positive for the disclosures as follows: CSR disclosure (0.09), environmental disclosure (0.32), social disclosure (0.52) and economic disclosure (0.17). These findings are in line with what was conjectured by the theory of disclosure regarding the voluntary publication of information (Verrecchia, 1983; Dye, 1985), especially in the discussions that were proposed by Healy and Palepu (2001) as to the fact that managers have incentives to fundamentally make the information that is favorable to them public.

## 4.2 Effect of CSR disclosure on profitability

Table 4 presents the results regarding the relationship between CSR disclosure and profitability. As it is observed in Table 4, the CSR disclosure, which is measured from the median of the weighted disclosure index, is positively related to return on assets (Model 1). These results were consistent with the argument that the decision to disclose voluntary information would be conditioned to some positive economic effect underlying the disclosure, in line with the theory of disclosure discretion. Similar to what was observed for

CSR disclosure, the results related to the environmental (Model 2), social (Model 3) and economic (Model 4) dimensions suggest that firms with higher weighted indices of environmental, social and economic disclosure (above the median) presented higher profitability than the others. For the analysis that considers the tone of disclosure as an instrumental variable, equivalent results were observed for Models 1 and 2.

Table 4
**Effect of CSR disclosure on profitability**

| ROA | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| toneRSC | 0.0147** | | | |
| toneENV | | 0.0038 | | |
| toneSOC | | | 0.0064 | |
| toneECO | | | | 0.0074** |
| discRSC | 0.0148** | | | |
| discENV | | 0.0158** | | |
| discSOC | | | 0.0124* | |
| discECO | | | | 0.0133** |
| TotalAssets | -0.0347*** | -0.0338*** | -0.0344*** | -0.0345*** |
| Leverage | -0.0094*** | -0.0097*** | -0.0096*** | -0.0095*** |
| Vol_ROA | -0.0369 | -0.0413 | -0.0372 | -0.0394 |
| Growth | 0.0343*** | 0.0355*** | 0.0348*** | 0.0347*** |
| Const. | 0.6131*** | 0.5993*** | 0.6097*** | 0.6107*** |
| Year | Yes | Yes | Yes | Yes |
| Sector | Yes | Yes | Yes | Yes |
| Num. Obs. | 1,270 | 1,270 | 1,270 | 1,270 |
| $R^2$ | 0.1261 | 0.1206 | 0.1197 | 0.1229 |
| Avg. VIF | 1.18 | 1.20 | 1.35 | 1.17 |
| Model | Fixed Eff. | Fixed Eff. | Fixed Eff. | Fixed Eff. |

Notes: *** = statistically significant at 1%; ** = statistically significant at 5%; * = statistically significant at 10%. Gray-highlighted coefficients indicate variables that were statistically significant at least at 10% in the additional two-stage least-squares analysis (instrumental variable: tone, lagged by one period).
Source: by the authors.

With regard to the tone of CSR disclosure, the results in Table 4 showed a positive and statistically significant relationship between the tone of CSR disclosure and the return on assets, thus indicating that corporate reports with a higher prevalence of optimistic terms can present better profitability indexes for the firm; on the other hand, in the additional robustness test that considers the disclosure tone as an instrumental variable, the effect of tone on profitability was not statistically significant, which provides only partial support to hypothesis $\mathbf{H_1}$. In this way, the findings are partially in line with the central assumption of the theory of disclosure discretion in the sense that the manager, due to the economic incentives inherent in decision-making, is more willing to publish, voluntarily, information that is favorable and, consequently, it can provide positive economic effects to the firm.

It should be mentioned that the positive relationship between disclosure tone and profitability had been documented in the literature, although it was outside the context of CSR. For example, Davis, Piger and Sedor (2012) observed that the optimistic tone that is adopted in the communication of results positively affects profitability in the following years. In turn, Davis and Tama-Sweet (2012) found worse financial performance for companies whose 10-Q and 10-K forms contained high levels of terms and expressions of a negative nature. From such perspective, this article indicates that the positive association between the tone of CSR disclosure and profitability also applies to the tone that is adopted in the voluntary disclosure of CSR.

Based on previous studies, there are several reasons that could justify better profitability rates in companies with superior CSR information disclosure. For example, the literature suggests that consumers are more willing to purchase products or services offered by companies with a good socio-environmental reputation (Ilmi, Kustono & Sayekti, 2017). Likewise, CSR information can be used to support the decision of individuals in order to choose the firm to work for or even to retain existing employees, thus generating benefits in terms of productivity and improvement of intellectual capital (Cormier, Ledoux & Magnan, 2011; Micah, Ofurum & Ihendinihu, 2012). Furthermore, as CSR information constitutes a sign of good socio-environmental conduct by the firm, it could also contribute to reduce labor litigation (Sánchez & Benito-Hernández, 2015) or environmental fines (Wasara & Ganda, 2019).

As for firms' characteristics, the results were similar for all models, including the ones for additional analyses by using two-stage least squares. The growth perspective presented a positive relationship with profitability, whereas a negative relationship was found for firm size and leverage. These findings are consistent with expectations, as according to previous studies, the growth opportunity can be positively associated with the future profitability of the firm (Pattitoni, Petracci & Spisni, 2014). With regard to the variable for financial leverage, Asimakopoulos, Samitas and Papadogonas (2009) corroborate the negative association with the return on assets due to the fact that high debts imply additional financial expenses, which reduce the resources that are available for investment and, consequently, the profitability indeces.

In the case of firm size, Pattitoni, Petracci and Spisni (2014) cite two reasons that explain the negative sign. The first one is that smaller firms are able to seize and identify profitable investment opportunities more easily than large firms are, due to their more flexible organizational structure. The second one is that some elements that are more valued by larger firms, such as prestige and other non-monetary benefits, distort organizational objectives, so that the expansion of assets becomes the focus in detriment of wealth generation.

### 4.3 Effect of CSR disclosure on market value

Table 5 presents the results for the effect of CSR disclosure on the firm's market value.

Table 5
**Effect of CSR disclosure on market value**

| MV | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| toneRSC | 0.1711*** | | | |
| toneENV | | 0.0373* | | |
| toneSOC | | | 0.0441 | |
| toneECO | | | | 0.0956*** |
| discRSC | 0.0487 | | | |
| discENV | | 0.0964* | | |
| discSOC | | | 0.0746 | |
| discECO | | | | 0.0611 |
| TotalAssets | 0.6438*** | 0.6517*** | 0.6476*** | 0.6430*** |
| Leverage | -0.2503*** | -0.2540*** | -0.2530*** | -0.2517*** |
| Vol_ROA | -0.0356 | -0.0767 | -0.0519 | -0.0383 |
| Growth | 0.3037*** | 0.3124*** | 0.3066*** | 0.3046*** |
| Const. | 5.3115*** | 5.1917*** | 5.2542*** | 5.3194*** |
| Year | Yes | Yes | Yes | Yes |
| Sector | Yes | Yes | Yes | Yes |
| Num. Obs. | 1,270 | 1,270 | 1,270 | 1,270 |
| $R^2$ | 0.6502 | 0.6448 | 0.6439 | 0.6502 |
| Avg. VIF | 1.18 | 1.20 | 1.35 | 1.17 |
| Model | Fixed Eff. | Fixed Eff. | Fixed Eff. | Fixed Eff. |

Notes: *** = statistically significant at 1%; ** = statistically significant at 5%; * = statistically significant at 10%. Gray-highlighted coefficients indicate variables that were statistically significant at least at 10% in the additional two-stage least-squares analysis (instrumental variable: tone, lagged by one period).
Source: by the authors.

Initially, it can be seen that unlike what was verified in the profitability models, the variable for CSR disclosure was not statistically significant to explain changes in market value (Model 1). According to the results in Table 5, the tone adopted in the corporate report can affect the company's market value (both by the conventional panel and by the two-stage least squares analysis). This is because the existence of a positive and statistically significant relationship between the tone of disclosure and market value was evidenced (Model 1), a result that supports hypothesis **$H_2$**. Therefore, it is understood that a more optimistic tone that is adopted in CSR publications can contribute to a higher firm's market value. This finding extended to the economic dimension, when it was evaluated separately (Model 4).

Therefore, the findings for the CSR disclosure tone are congruent with what is usually found in the literature. Rogers, Buskirk and Zechman (2011) state that it is expected that corporate reports whose tone is predominantly optimistic imply an increase in the firm's market value, as good news raises investors' expectations and, therefore, positively impacts stock price. Furthermore, as the tone of environmental and economic disclosure were statistically significant, the results are in line with the study by Plumlee et al. (2015). This suggests that, for investors, the optimistic publication of CSR information matters, especially if the focus is on environmental or economic issues.

Statistically significant results were found for all control variables related to the firms' characteristics, except for ROA volatility. Size and growth were positively related to market value, whereas leverage was inversely associated. Aggarwal and Padhan (2017) argue that larger firms are less prone to bankruptcy and, therefore, tend to have a higher market value when compared to others. With regard to the perspective of growth, the findings were in line with Wang (2008). The inverse relationship observed for leverage is consistent with Nekhili et al. (2017), and it is justified by the fact that firms with high levels of debt may be neglected by investors, with negative implications for their market value.

### 4.4 Effect of CSR disclosure on cost of capital

Table 6 indicates the findings for the models whose dependent variable was the cost of capital, measured by the weighted average cost of capital (WACC).

Table 6
**Effect of CSR disclosure on the cost of capital**

| WACC | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| toneRSC | -0.0114** | | | |
| toneENV | | -0.0056** | | |
| toneSOC | | | -0.0031 | |
| toneECO | | | | -0.0039 |
| discRSC | 0.0014 | | | |
| discENV | | -0.0054 | | |
| discSOC | | | -0.0003 | |
| discECO | | | | 0.0015 |
| TotalAssets | 0.0067 | 0.0067 | 0.0065 | 0,0064 |
| Leverage | -0.0042*** | -0.0039*** | -0.0040*** | -0,0041*** |
| Vol_ROA | 0.0823** | 0.0831** | 0.0850** | 0.0831** |
| Growth | -0.0077 | -0.0082 | -0.0079 | -0.0078 |
| Const. | -0.0012 | 0.0031 | 0.0023 | 0.0029 |
| Year | Yes | Yes | Yes | Yes |
| Sector | Yes | Yes | Yes | Yes |
| Num. Obs. | 1,270 | 1,270 | 1,270 | 1,270 |
| $R^2$ | 0.4637 | 0.4643 | 0.4605 | 0.4614 |
| Avg. VIF | 1.18 | 1.20 | 1.35 | 1.17 |
| Model | Fixed Eff. | Fixed Eff. | Fixed Eff. | Fixed Eff. |

Notes: *** = statistically significant at 1%; ** = statistically significant at 5%; * = statistically significant at 10%. Gray-highlighted coefficients indicate variables that were statistically significant at least at 10% in the additional two-stage least-squares analysis (instrumental variable: tone, lagged by one period).
Source: by the authors.

The results that were presented did not allow for any inferences regarding either the positive or the negative effect of CSR disclosure on the cost of capital to be made, as they did not show any statistical significance (Model 1). As to the variables for the different dimensions of CSR, the results were equivalent to those that were verified when the aggregate measure of CSR disclosure was considered. Therefore, in the models whose independent variables of interest were environmental disclosure (Model 2), social disclosure (Model 3) and economic disclosure (Model 4), the results did not allow for any inferences regarding the impacts of disclosure on the cost of capital either. The same result was observed for the two-stage least squares analyses.

As the results did not show any relationship between CSR disclosure and the cost of capital, previous studies, such as those by Dhaliwal et al. (2011), Dhaliwal et al. (2014), Li and Foo (2015) and Michaels and Grüning (2017), were not corroborated in this research. However, Weber (2018) similarly found no significant association when she was assessing if the level of socio-environmental disclosure could explain variations in the firm's cost of capital. According to Weber (2018), as CSR information does not provide external guarantees to the firm (e.g., this information is not externally audited) in terms of the reliability of published content, the possible benefits in the cost of capital that arise from better CSR disclosure would be compromised.

On the other hand, the analysis of the disclosure tone, specifically for the variable concerning the consolidated CSR disclosure (Model 1), points out that the prevalence of positive expressions in the reports implies reductions in the cost of capital, a result that is in line with hypothesis $\mathbf{H_3}$. The tone of disclosure in the economic dimension, based on the results of the two-stage least squares model, also indicated a negative and significant effect on the cost of capital. It should be mentioned that Plumlee et al. (2015) reached similar conclusions, since they found that their environmental disclosure measure was not relevant to explain the cost of capital, although items classified as positive (negative) in their disclosure index were negatively (positively) associated with the capital cost.

Regarding the control variables, financial leverage showed a negative and statistically significant relationship with the cost of capital in all models (including the two-stage least squares robustness analysis), whereas the signal observed for ROA volatility was the opposite. In relation to the ROA volatility, the explanation lies in the fact that such a measure is directly related to risk assessment and, therefore, high levels of volatility may imply a higher cost of capital (Konchitchki et al., 2016). In the case of leverage, the results found do not adhere to the conventional approach of capital structure, which assumes that the firm seeks to minimize its total cost of capital based on optimal proportions between its own sources and third-party financing ones.

**5 Final Remarks**

The main purpose of this study was to examine the effects of CSR disclosure tone, in the environmental, social and economic dimensions, on the performance of Brazilian listed companies. The main findings showed that firms whose published reports presented a prevalence of an optimistic tone had, on average, a higher market value and a lower cost of capital. This allows us to conclude that the voluntary disclosure of CSR information can, depending on the tone that is adopted in the publication, bring benefits in economic terms, as it is assumed by the theory of disclosure discretion.

With regard to the tone of the disclosure, considering each CSR dimension that is observed individually (environmental, social and economic ones), the tone of the economic disclosure was the one that demonstrated the greatest relevance in terms of impact on the evaluated measures, particularly for the case of market value (in which it was significant in the panel data analysis and also in the two-stage least squares robustness test). It suggests that, despite the fact that companies invest resources in social and environmental dimensions, the economic area still seems to be the most relevant one to define the performance of firms in the Brazilian environment.

These findings allowed us to support hypotheses $\mathbf{H_2}$ and $\mathbf{H_3}$, which conjecture that the positive (negative) tone of CSR disclosure has a positive (negative) effect on the firm's market value and cost of capital, respectively. Therefore, these findings reinforce the understanding of the discretionary disclosure theory in which decisions that involve either the disclosure or the retention of voluntary information depend on the economic impacts that arise from the good or bad news to be publicized (Verrecchia, 1983). In addition, the different effects that are observed for the dimensions of CSR reinforce Carroll and Shabana's (2010) understanding that the implications of CSR on firm performance are not homogeneous among the pillars that compose it, varying, therefore, according to environmental situations and to stakeholder expectations.

Based on these results and on the discussion, it is understood that this research, in addition to innovating in the sense of considering the disclosure of CSR in its different underlying topics (environmental, social and economic ones) and the optimistic or pessimistic tone used in the reports, also collaborates by establishing a precedent to avoid considering a generic CSR disclosure for evaluation. In other words, the conclusions that are drawn from this study suggest that simply by observing whether an observation of a given report should be published is not enough to examine CSR disclosure in depth, as it does not allow one to identify the different effects that environmental, social and economic information has on the measures of the firm's performance. A simplified analysis similarly does not allow the evaluation of the impact of good or bad news related to the CSR disclosure, especially when considering that different stakeholders of the firm may assign different levels of importance to the topics that were highlighted.

In practical terms, it is expected that the current research can bring contributions to companies, specifically to managers and the investor relations department, as it demonstrates the relevance of the tone that is adopted in CSR publications for the firm's performance measures, thus characterizing a possible element to be strategically considered by the firm. Likewise, it is expected that the findings can support actions by regulatory bodies with the aim of protecting investors, or even other stakeholders, from the misuse of CSR disclosure by firms, such as the adoption of an incompatible tone of disclosure with reality and/or omission of negative information in the reports, as well as facilitating access to information through guidelines for the publication of these documents.

Despite the advances and the contributions, this study is subject to limitations. Even when addressing the environmental, social and economic pillars of CSR, other topics that permeate it come into play, such as the voluntary and stakeholder perspectives (Carroll & Shabana, 2010), which were not contemplated. Firm performance is also a comprehensive concept, and it can go beyond the proxies for profitability, market value and cost of capital. In this sense, when evaluating the relationship between CSR disclosure and firm performance, one must keep in mind that performance is limited to the measures that are considered here.

Some limitations regarding the measurement of CSR disclosure occur as well. When using the frequency of words in the reports to estimate the disclosure index, the variable does not allow inferring about qualitative elements of the published information, such as comprehensibility and conciseness. Likewise, the classification of words according to their nature, that is, positive, neutral or negative ones, does not allow evaluating the context in which the term was used, so that a certain keyword with a negative meaning could have been used in a positive context, depending on the totality of the sentence that was used in the corporate report. As the classification of words in the dictionary categories was based on the judgment of these researchers, the procedure involves a certain subjectivity and, therefore, it also characterizes a limitation.

It should also be mentioned that CSR information represents a type of voluntary disclosure. Therefore, there is no specific format on which and how the information should be presented. Likewise, how often CSR reports are disclosed is at the firm's discretion, as well as whether this publication will be accomplished again in subsequent years. All these circumstances characterize a limitation of studies that involves CSR disclosure and, specifically in the case of the current research, such limitation occurs in the textual analysis of reports based on the dictionary that is elaborated fundamentally due to the variation in volume, form of presentation and type of information that is disclosed by companies.

Finally, future researches can deepen the analysis of CSR disclosure based on publication standards other than the GRI, given that, depending on the standard that is adopted in the report, additional information may be disclosed and, consequently, affect the results for the relationship between CSR disclosure and performance. Even considering only the GRI standard, advances are feasible by means of an examination of the environmental, social and economic dimensions.

## References

Abu Qa'Dan, M. B., Suwaidan, M. S. (2019). Board composition, ownership structure and corporate social responsibility disclosure: the case of Jordan. *Social Responsibility Journal, 15*(1), 28-46. https://doi.org/10.1108/SRJ-11-2017-0225

Aggarwal, D., & Padhan, P. C. (2017). Impact of capital structure on firm value: Evidence from Indian hospitality industry. *Theoretical Economics Letters, 7*(4), 982-1000. https://doi.org/10.4236/tel.2017.74067

Asimakopoulos, I., Samitas, A., & Papadogonas, T. (2009). Firm-specific and economy wide determinants of firm profitability: Greek evidence using panel data. *Managerial Finance, 35*(11), 930-939. https://doi.org/10.1108/03074350910993818

Balabanis, G., Phillips, H. C., & Lyall, J. (1998). Corporate social responsibility and economic performance in the top British companies: are they linked?. *European business review, 98*(1), 25-44. https://doi.org/10.1108/09555349810195529

Bidhari, S. C., Salim, U., Aisjah, S., & Java, E. (2013). Effect of corporate social responsibility information disclosure on financial performance and firm value in banking industry listed at Indonesia stock exchange. *European Journal of Business and Management, 5*(18), 39-46.

Borges Júnior, D. M. (2019). Relatório de Sustentabilidade e Desempenho das Firmas Brasileiras de Capital Aberto. *Revista Catarinense da Ciência Contábil, 18*(1), 1-13. https://doi.org/10.16930/2237-766220192779

Burgwal, D., Vieira, R. J. O. (2014). Determinantes da divulgação ambiental em companhias abertas holandesas. *Revista Contabilidade & Finanças, 25*(64), 60-78. https://doi.org/10.1590/S1519-70772014000100006

Cahan, S. F., Villiers, C., Jeter, D. C., Naiker, V., Staden, C. J. (2016). Are CSR Disclosures Value Relevant? Cross-Country Evidence. *European Accounting Review, 25*(3), 579-611. https://doi.org/10.1080/09638180.2015.1064009

Carè, R., & Forgione, A. F. (2019). Assessing the Relationship Between Environmental Performance and Banks' Performance: Preliminary Evidence. In *Socially Responsible Investments* (pp. 61-85). Palgrave Pivot, Cham. https://doi.org/10.1007/978-3-030-05014-6_4

Carroll, A. B., & Shabana, K. M. (2010). The business case for corporate social responsibility: A review of concepts, research and practice. *International Journal of Management Reviews*, *12*(1), 85-105. https://doi.org/10.1111/j.1468-2370.2009.00275.x

Cormier, D., Ledoux, M. J., & Magnan, M. (2011). The informational contribution of social and environmental disclosures for investors. *Management Decision, 49*(8), 1276-1304. https://doi.org/10.1108/00251741111163124

Crisóstomo, V. L., Forte, H. C., Prudêncio, P. A. (2020). Uma análise da adesão de organizações brasileiras à GRI como método de divulgação de informações de responsabilidade social corporativa. *Revista Ambiente Contábil, 12*(2), 47-73. https://doi.org/10.21680/2176-9036.2020v12n2ID19005

Davis, A. K., & Tama-Sweet, I. (2012). Managers' use of language across alternative disclosure outlets: Earnings press releases versus MD&A. *Contemporary Accounting Research*, *29*(3), 804-837. https://doi.org/10.1111/j.1911-3846.2011.01125.x

Davis, A. K., Piger, J. M., & Sedor, L. M. (2012). Beyond the numbers: Measuring the information content of earnings press release language. *Contemporary Accounting Research*, *29*(3), 845-868. https://doi.org/10.1111/j.1911-3846.2011.01130.x

Debortoli, S., Muller, O., Brocke, J. V. (2014). Comparing business intelligence and big data skills. *Business & Information Systems Engineering, 6*(5), 289-300. https://doi.org/10.1007/s12599-014-0344-2

Deng, Q., Hine, M., Ji, S., & Sur, S. (2017, January). Building an environmental sustainability dictionary for the IT industry. In *Proceedings of the 50th Hawaii International Conference on System Sciences*. https://doi.org/10.24251/HICSS.2017.112

Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The Accounting Review*, *86*(1), 59-100. https://doi.org/10.2308/accr.00000005

Dhaliwal, D., Li, O. Z., Tsang, A., & Yang, Y. G. (2014). Corporate social responsibility disclosure and the cost of equity capital: The roles of stakeholder orientation and financial transparency. *Journal of Accounting and Public Policy*, *33*(4), 328-355. https://doi.org/10.1016/j.jaccpubpol.2014.04.006

Du, S., & Yu, K. (2020). Do corporate social responsibility reports convey value relevant information? Evidence from report readability and tone. *Journal of Business Ethics*, 1-22. https://doi.org/10.1007/s10551-020-04496-3

Dye, R. A. (1985). Disclosure of nonproprietary information. *Journal of Accounting Research*, 123-145. https://doi.org/10.2307/2490910

Elshandidy, T.; Fraser, I., Hussainey, K. (2013). Aggregated, voluntary, and mandatory risk disclosure incentives: Evidence from UK FTSE all-share companies. *International Review of Financial Analysis, 30*(1), 320-333. https://doi.org/10.1016/j.irfa.2013.07.010

Fávero, L. P., & Belfiore, P. (2017). *Manual de análise de dados*: estatística e modelagem multivariada com Excel®, SPSS® e Stata®. Elsevier Brasil.

Gelman, A., & Hill, J. (2007). *Data analysis using regression and multilevel/hierarchical models*. Cambridge University Press. https://doi.org/10.1017/CBO9780511790942

Greene, W. H. (2012). *Econometric Analysis*. 7th Edition (International Edition), Pearson.

Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics, 31*(3), 405-440. https://doi.org/10.1016/S0165-4101(01)00018-0

Henry, E., & Leone, A. J. (2016). Measuring qualitative information in capital markets research: Comparison of alternative methodologies to measure disclosure tone. *The Accounting Review*, *91*(1), 153-178. https://doi.org/10.2308/accr-51161

Huang, X., Teoh, S. H., Zhang, Y. (2014). Tone management. *The Accounting Review, 89*(3), 1083-1113, 2014. https://doi.org/10.2308/accr-50684

Ilmi, M., Kustono, A. S., & Sayekti, Y. (2017). Effect of Good Corporate Governance, Corporate Social Responsibility Disclosure and Managerial Ownership to The Corporate Value with Financial Performance as Intervening Variables: Case on Indonesia Stock Exchange. *International Journal of Social Science and Business, 1*(2), 75-88.

Kamatra, N., & Kartikaningdyah, E. (2015). Effect corporate social responsibility on financial performance. *International Journal of Economics and Financial Issues*, 5(1), 157-164.

Kim, J. W., & Shi, Y. (2011). Voluntary disclosure and the cost of equity capital: Evidence from management earnings forecasts. *Journal of Accounting and Public Policy*, *30*(4), 348-366. https://doi.org/10.1016/j.jaccpubpol.2011.03.001

Konchitchki, Y., Luo, Y., Ma, M. L., & Wu, F. (2016). Accounting-based downside risk, cost of capital, and the macroeconomy. *Review of Accounting Studies, 21*(1), 1-36. https://doi.org/10.1007/s11142-015-9338-7

KPMG. (2018). The KPMG survey of corporate responsibility reporting 2017.

Lesage, C., & Wechtler, H. (2012). An inductive typology of auditing research. *Contemporary Accounting Research, 29*(2), 487-504. https://doi.org/10.1111/j.1911-3846.2011.01111.x

Li, Y., & Foo, C. T. (2015). A sociological theory of corporate finance Societal responsibility and cost of equity in China. *Chinese Management Studies, 9*(3), 269-294. https://doi.org/10.1108/CMS-12-2014-0232

Li, Y., Gong, M., Zhang, X. Y., & Koh, L. (2018). The impact of environmental, social, and governance disclosure on firm value: The role of CEO power. *The British Accounting Review, 50*(1), 60-75. https://doi.org/10.1016/j.bar.2017.09.007

Li, S., & Liu, C. (2018). Quality of corporate social responsibility disclosure and cost of equity capital: Lessons from China. *Emerging Markets Finance and Trade, 54*(11), 2472-2494. https://doi.org/10.1080/1540496X.2018.1443441

Loughran, T., & McDonald, B. (2016). Textual analysis in accounting and finance: A survey. *Journal of Accounting Research*, *54*(4), 1187-1230. https://doi.org/10.1111/1475-679X.12123

Merkley, K. J. (2014). Narrative disclosure and earnings performance: Evidence from R&D disclosures. *The Accounting Review, 89*(2), 725-757. https://doi.org/10.2308/accr-50649

Micah, L. C., Ofurum, C. O., & Ihendinihu, J. U. (2012). Firms financial performance and human resource accounting disclosure in Nigeria. *International Journal of Business and Management, 7*(14), 67-75. https://doi.org/10.5539/ijbm.v7n14p67

Michaels, A., & Grüning, M. (2017). Relationship of corporate social responsibility disclosure on information asymmetry and the cost of capital. *Journal of Management Control*, *28*(3), 251-274. https://doi.org/10.1007/s00187-017-0251-z

Mittelbach-Hörmanseder, S., Hummel, K., & Rammerstorfer, M. (2021). The information content of corporate social responsibility disclosure in Europe: an institutional perspective. *European Accounting Review, 30*(2), 309-348. https://doi.org/10.1080/09638180.2020.1763818

Muttakin, M. B., & Subramaniam, N. (2015). Firm ownership and board characteristics. *Sustainability Accounting, Management and Policy Journal*. https://doi.org/10.1108/SAMPJ-10-2013-0042

Nekhili, M., Nagati, H., Chtioui, T., & Rebolledo, C. (2017). Corporate social responsibility disclosure and market value: Family versus nonfamily firms. *Journal of Business Research, 77*(1), 41-52. https://doi.org/10.1016/j.jbusres.2017.04.001

Novaes, P. V., & Almeida, J. E. (2021). O Papel dos Estágios do Ciclo de Vida da Firma sobre o Disclosure Voluntário e o Custo de Capital Próprio nas Companhias Abertas Brasileiras. *Brazilian Business Review, 17*(6), 1-20. https://doi.org/10.15728/bbr.2020.17.6.1

Pattitoni, P., Petracci, B., & Spisni, M. (2014). Determinants of profitability in the EU-15 area. *Applied Financial Economics, 24*(11), 763-775. https://doi.org/10.1080/09603107.2014.904488

Plumlee, M., Brown, D., Hayes, R. M., & Marshall, R. S. (2015). Voluntary environmental disclosure quality and firm value: Further evidence. *Journal of Accounting and Public policy*, *34*(4), 336-361. https://doi.org/10.1016/j.jaccpubpol.2015.04.004

Reverte, C. (2012). The impact of better corporate social responsibility disclosure on the cost of equity capital. *Corporate Social Responsibility and Environmental Management, 19*(5), 253-272.

Rogers, J. L., Van Buskirk, A., & Zechman, S. L. (2011). Disclosure tone and shareholder litigation. *The Accounting Review*, *86*(6), 2155-2183. https://doi.org/10.2308/accr-10137

Sánchez, P. E., & Benito-Hernández, S. (2015). CSR policies: Effects on labour productivity in Spanish micro and small manufacturing companies. *Journal of Business Ethics, 128*(4), 705-724.

https://doi.org/10.1007/s10551-013-1982-x

Sarumpaet, S., Nelwan, M. L., & Dewi, D. N. (2017). The value relevance of environmental performance: evidence from Indonesia. *Social Responsibility Journal*. https://doi.org/10.1108/SRJ-01-2017-0003

Verbeeten, F. H., Gamerschlag, R., & Möller, K. (2016). Are CSR disclosures relevant for investors? Empirical evidence from Germany. *Management Decision, 54*(6), 1359-1382. https://doi.org/10.1108/MD-08-2015-0345

Verrecchia, R. E. (1983). Discretionary disclosure. *Journal of Accounting and Economics*, *5*(1), 179-194. https://doi.org/10.1016/0165-4101(83)90011-3

Virtania, L. O., & Siregar, S. V. (2017, November). The Effect of Environmental Disclosure on Cost of Equity. In *International Conference on Business and Management Research (ICBMR 2017)*. Atlantis Press. https://doi.org/10.2991/icbmr-17.2017.9

Wang, J. C. (2008). Investigating market value and intellectual capital for S&P 500. *Journal of intellectual capital, 9*(4), 546-563. https://doi.org/10.1108/14691930810913159

Wasara, T. M., & Ganda, F. (2019). The relationship between corporate sustainability disclosure and firm financial performance in Johannesburg Stock Exchange (JSE) listed mining companies. *Sustainability*, *11*(16), 4496. https://doi.org/10.3390/su11164496

Weber, J. L. (2018). Corporate social responsibility disclosure level, external assurance and cost of equity capital. *Journal of Financial Reporting and Accounting*. https://doi.org/10.1108/JFRA-12-2017-0112

Weber, R. P. (1983). Measurement models for content analysis. *Quality and Quantity, 17*(2), 127-149. https://doi.org/10.1007/BF00143616

Yekini, L. S., Wisniewski, T. P., & Millo, Y. (2016). Market reaction to the positiveness of annual report narratives. *The British Accounting Review*, *48*(4), 415-430. https://doi.org/10.1016/j.bar.2015.12.001

Yusoff, H., Mohamad, S. S., & Darus, F. (2013). The influence of CSR disclosure structure on corporate financial performance: Evidence from stakeholders' perspectives. *Procedia Economics and Finance*, 7, 213-220. https://doi.org/10.1016/S2212-5671(13)00237-2

## NOTES

**ACKNOWLEDGMENT**
Professor Rodrigo F. Malaquias thanks the National Council for Scientific and Technological Development (CNPq) for the support for the development of part of this research. The authors thank the participants of the XLV ANPAD Meeting - EnANPAD 2021 for the comments and suggestions regarding this study, as well as thank the reviewers for the suggestions to improve the quality of this research.

**AUTHORSHIP CONTRIBUTION**
Conception and preparation of the manuscript: D. M. Borges Júnior
Data collection: D. M. Borges Júnior, R. F. Malaquias
Data analysis: D. M. Borges Júnior, R. F. Malaquias
Discussion of the results: D. M. Borges Júnior, R. F. Malaquias
Review and approval: D. M. Borges Júnior, R. F. Malaquias

**DATASET**
The dataset that supports the results of this study is not publicly available.

**FINANCING**
Professor Rodrigo F. Malaquias thanks the National Council for Scientific and Technological Development (CNPq) for the support for the development of part of this research.

**CONSENT TO USE IMAGE**
Does not apply.

**APPROVAL OF THE RESEARCH ETHICS COMMITTEE**
Does not apply.

**CONFLICT OF INTERESTS**
Does not apply.



**PUBLISHER**
Federal University of Santa Catarina. Accounting Sciences Course and Postgraduate Program in Accounting. Publication on the UFSC Journal Portal. The ideas expressed in this article are the responsibility of their authors, and do not necessarily represent the opinion of the editors or the university.

**EDITORS**
José Alonso Borba, Denize Demarche Minatti Ferreira, Carlos Eduardo Facin Lavarda.

**HISTORIC**
Received on: 25/10/2021 - Peer reviewed on: 18/04/2022 - Reformulated on: 16/06/2022 - Recommended for publication on: 12/12/2022 - Published on: 26/12/2022

** A preprint version of the paper was presented at EnANPAD, 2021*