

Relationship between environmental disclosure and financial performance: a systematic review of literature

Relação entre disclosure ambiental e desempenho financeiro: uma revisão sistemática da literatura

DOI: 10.34188/bjaerv5n2-045

Recebimento dos originais: 20/01/2022

Aceitação para publicação: 31/03/2022

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ABSTRACT

Environmental disclosure allows potential investors in financial capital to better evaluate and monitor investment opportunities, since from these it is possible to follow the evolution of the companies, the actions taken by them in the past and those that will be fulfilled in the future. Thus, the objective of this study is to establish a systematic literature review of the relationship between environmental disclosure and financial performance published on the basis of web of science periodicals. The search of the keywords in the base was based on the title. The articles were analyzed individually, resulting in 27 articles aligned to the objective forming the textual corpus. The three classical laws of bibliometric distribution were applied: Lotka (1926), Bradford (1948) and Zipf (1945). In the results, the most important factors were Business, Environmental Sciences, Engineering Environmental and Biodiversity Conservation, with 2018 the year with the largest number of publications and the United Kingdom and the United States the most published on the subject. From the analyzes, it was identified that the theme Disclosure and Performance are in fact broad with broad possibilities of approach in the academic sphere, being financial performance the central theme in the relationship between the concepts approached.

Keywords: Environmental Disclosure, Financial Performance, Sustainability, Business.

RESUMO

A divulgação ambiental permite que potenciais investidores em capital financeiro avaliem e acompanhem melhor as oportunidades de investimento, pois a partir delas é possível acompanhar a evolução das empresas. O objetivo deste estudo é estabelecer uma revisão sistemática da literatura sobre a relação entre *disclosure* ambiental e desempenho financeiro publicada com base em periódicos da web of science. A busca das palavras-chave na base foi baseada no título. Os artigos foram analisados individualmente, resultando em 27 artigos alinhados ao objetivo formando o corpus textual. Foram aplicadas as três leis clássicas da distribuição bibliométrica: Lotka (1926), Bradford (1948) e Zipf (1945). Nos resultados, os fatores mais importantes foram Negócios, Ciências Ambientais, Engenharia Ambiental e Conservação da Biodiversidade, sendo 2018 o ano com maior número de publicações e Reino Unido e Estados Unidos os mais publicados sobre o assunto. A partir das análises, identificou-se que o tema Divulgação e Desempenho é de fato abrangente e com amplas possibilidades de abordagem no âmbito acadêmico, sendo desempenho financeiro o tema central na relação entre os conceitos abordados.

Palavras-chave: Disclosure Ambiental, Desempenho financeiro, Sustentabilidade, Gestão.

1 INTRODUCTION

The expression designated as disclosure, whether mandatory or voluntary, can be defined based on Gibbin, Richardson and Waterouse Gibbins et al. (1990) and Niyama and Gomes (2016) as a strategic behavior of companies to reduce information asymmetry. Consequently, it allows potential investors of financial capital, a better assessment and monitoring of investment opportunities, since from them it is possible to follow the evolution of companies, the actions carried out by them in the past and those that will be carried out in the future.

Murcia et al. (2010) showed a still incipient amount of national research with the theme “voluntary environmental disclosure”, and those that have been published are focused on studies in the pulp and paper sector Costa; Marion (2007), Brazilian companies that invested in shares on the New York Stock Exchange (Borba, Rover; Dal-Ri Murcia (2008) and technical issues, involving the dissemination of Social Balance (CUNHA; RIBEIRO; DE OLIVEIRA, 2006).

In the international context, it can be seen that some research has also been developed in the same direction, based on the informativeness index and the quality/efficiency of the Corporate Social Responsibility (CSR) Reports (ODRIOZOLA; BARAIBAR-DIEZ, 2017).

The measure used to assess the level of voluntary disclosure refers to the voluntary disclosure index, which was a contribution given by Eng and Mak (2003) when they composed a disclosure index composed of 46 items, contained in an “annual report” to qualitatively and quantitatively analyze the information provided. Almeida and Goulart (2017) carried out a qualitative study of the economic and socio-environmental disclosure practices of the largest companies in Brazil, identifying that disclosure is widely used, especially by companies with greater polluting capacity.

Companies that voluntarily disclose their environmental information, when widely disclosed in markets to the interested public, generally have a capital market characterized as developed. This leads to the reduction of information asymmetry in relation to managers who, by chance, have privileged information, in addition to minimizing the risk for investors in general.

For Bushman and Smith (2001) companies that have a better level of disclosure show better expectations to their investors in reducing adverse selection related to information asymmetry through transparency. This increase in the disclosure of information by the company reflects in the reduction of the cost of agency for investors, and concomitantly, increases the value of the company. The existence of standards for the disclosure of environmental information can lead companies in general to define their responsibilities, in addition to publishing useful reports for society, while helping the management of organizations in the assessment of the environmental issues of their operations, resulting in efficiency and competitiveness in the market.

Thus, the improvement in the image of companies before their stakeholders regarding the voluntary disclosure of available information, influences the raising of funds, as well as the economic and financial performance from important strategic actions carried out in the most diverse areas, including the areas social and environmental (DIAS, 2007). In this context, the present research aims to establish a systematic literature review of the relationship between environmental disclosure and financial performance published in the *Web Of Science* journals.

The importance of carrying out a systematic review can be justified by the fact that this type of research presents conclusive results in its empirical results, given that there is evidence that such results, arising from scientific research already carried out, present inconclusive, positive or even negative results, which may lead to a meta-analytic study in the future, thus enabling the summarization of data from a large number of studies that could not be addressed in a narrative literature review.

Since systematic literature reviews on this topic are conducted based on the research problem, this proposal seeks to answer the following question: what is the relationship between environmental disclosure and financial performance? It should be noted that the development of the systematic literature review process enables the identification, mapping and analysis of relevant research on a specific problem or research topic (DE ALMEIDA BIOLCHINI et al., 2007; KITCHENHAM, 2004a; TRANFIELD; DENYER; SMART, 2003).

The work is structured in five sections summarized as follows: the first brings the introduction; the second presents the theoretical framework; The third contains the methodological procedures; the fourth brings the presentation and analysis of the data and the fifth corresponds to the final considerations of the research.

2 THEORETICAL FRAMEWORK

2.1 ENVIRONMENTAL DISCLOSURE

The benefits arising from the disclosure of voluntary information according to Dye (2001) must be greater than its costs. Likewise, Gray et al. (2001) also stated that it is possible to understand voluntary disclosure, in which environmental information is inserted, as a way of reducing agency costs.

In the views of Petty and Guthrie (2000) environmental information can be described in accounting reports in four ways, namely: descriptive; quantitative and non-monetary; quantitative and monetary and quantitative monetary and non-monetary. Based on the typology reported, it can be seen that environmental disclosure for internal management is a sine qua non condition for the establishment of standards for environmental information, where disclosure is managed by society,

based on laws and regulations as well as the organizations, from the consequences on their strategic objectives.

In the literature on environmental disclosure, the work developed by Verrecchia (2001) can be highlighted, where he proposed to analyze different models about disclosure, establishing from this, three categories, namely: a) association-based disclosure research; b) judgment-based research (discretionary-based disclosure) and c) efficiency-based disclosure research.

According to Piacentini (2004), the disclosures of a voluntary nature are used by investors with the objective of analyzing the strategies and critical success factors of a company, both in the environment in which they are inserted, and under the competitive aspect of the economic scenario. In this context, the information provided voluntarily serves the organization to demonstrate to its users what is being done to improve and maintain the well-being of the community.

When environmental disclosure is required by legislation, the regulation is called mandatory environmental disclosure. The company's spontaneity in revealing its information, even if it is based on guidelines and guidelines, is called voluntary disclosure. Disclosure process is related to the concept of corporate transparency and, in this sense, the authors define it as the dissemination of relevant and reliable information about operational, financial performance, opportunities investment, governance, values and risks, (Bushman, Piotroski and Smith, 2004).

Lindstaed and Ott (2009) reveal that the worsening of ecological issues, environmental legislation, as well as society's awareness of the responsibilities of companies in preserving the environment, increase the requirements related to transparency and responsibility. Similarly, the views of Lins and Silva (2010) show that disclosure represents an important means of communication about the performance of an organization to its stakeholders: shareholders, creditors, supervisory and control bodies, government and employees. For this reason, disclosure plays an essential role in reducing information asymmetry between managers and those who have interests in the company, especially investors.

Clarkson et al. (2008) examined a sample of companies belonging to sectors with high environmental impact. The authors concluded that there is a positive relationship between performance and voluntary environmental disclosure. They are observed that the disclosure of information of an environmental nature varies according to the organization, with the sectors of activity and even the country.

In this context, it can be deduced that by voluntarily disclosing environmental information, companies that have a sustainable relationship between their production process and the exploitation of natural resources have investments in projects of an environmental nature. Therefore, if the company does not disclose such information, it can be deduced that potential users of the

information may interpret that it does not assume certain commitments in relation to the environment in which it operates, which may impact, in some way, the valuation of its assets.

For Lima and Pereira (2011), disclosure plays an essential role in reducing the information asymmetry that exists between the company and the stakeholders, being seen as one of the main forms of communication between the company and the various users interested in evaluating the performance of the administration.

Suttipun and Stanton (2012) showed the environmental disclosures on the websites of companies listed on the Thai Stock Exchange (SET), and the relationship between the amount of disclosures and a variety of factors. The results indicated that 88% of the companies in the sample provided environmental information on their websites, and that there was a relationship between the amount of disclosures and the type of industry, ownership and auditing company status. In this sense, the disclosure of socio-environmental actions to stakeholders can be used strategically as a way of managing corporate reputation (CARDOSO; DE LUCA; GALLON, 2014).

Thus, it can be said that socio-environmental disclosure is characterized as an administrative strategy to improve the corporate image and reputation. Lopes et al. (2017) studied the relationship between socio-environmental disclosure, corporate reputation and value creation in companies listed on the BM&FBovespa. The survey gathered 305 companies listed on the Brazilian stock exchange and the results showed that companies in sectors with high environmental impact have greater socio-environmental disclosure and that this type of disclosure has a positive relationship with corporate reputation and has no significant relationship with value creation.

When taking into account the socio-environmental concern, there is a concern on the part of some organizations regarding the methodology for preparing reports and indicators to standardize and assist companies in the process of disclosing information.

2.2 FINANCIAL PERFORMANCE

Hendriksen and Van Breda (1999) emphasize that performance measurement can be performed using monetary values, normally using accounting and financial data, and/or from the point of view of non-monetary information. The combination of information of both natures can lead the performance evaluation system to a different condition with regard to certain predictions to support the decision-making process.

Chaves and Assumpção (2008) state that the measurement of performance is important to verify if the objectives established by the company are being achieved, also helping in the better application of resources. The biggest current obstacle is to identify the ideal structure of the Performance Measurement System (SMD) which is defined by Neely (1998) as the process of

quantifying the efficiency and effectiveness of past actions, from the acquisition, collection, classification, analysis, interpretation and dissemination of appropriate data, generating important information for actions preventive and/or corrective measures are taken.

The assessment of financial performance, when properly performed, guarantees support for the decision-making process in the organization, especially when strategic plans are involved that can influence the organization's growth and creation of value for shareholders. Analyzes with this focus aim to support the manager when defining policies, actions and goals present in the organization's strategic planning (SOUZA, 2005).

In addition, the concern with financial indices is also necessary because of the company's accountability to society. Or rather, financial performance directly influences the corporate social behavior of companies, as those that have a good financial performance can apply resources in the social dimension (PAVIE, 2008).

When evaluating the performance of organizations through financial indicators, a recurring practice that allows comparisons to be made between them, Ching, Marques and Prado (2008), show that the use of statements is seen as one of the most relevant languages for the purpose of evaluating the business from accounting information extracted from balance sheets. However, it should be noted that the analysis of indices is not exclusively about the application of an isolated operation. A fundamental aspect in the process is the interpretation and the ability to conclude whether the indicator is positive or negative in a given circumstance (GITMAN, 2010).

Financial performance is also related to several factors, as shown in the study by Chiun Lo et al. (2016) in which the authors concluded that financial performance is related to the disclosure of the overall vision and mission of the entire company, in addition to technological and entrepreneurial orientation.

Finally, the indicators use information extracted from the balance sheet and income statements, to analyze previous periods as well as to compare performance between organizations. From them, you have a broad view of the real financial and economic situation, generating accurate information, which combined with good strategic planning, can predict and consequently avoid future problems. In this way, they contribute to achieving better results, resulting in increased profitability and profit.

3 METHODOLOGICAL PROCEDURES

In order to carry out a systematic literature review, the same procedures used in the study developed by De Almeida Biolchini et al. (2007); Kitchenham (2004b); Tranfield, Denyer and Smart (2003), when prioritizing information on bibliographic research, inclusion and exclusion

criteria on the researched relationship. The work is based on the research question raised in this study: what is the relationship between environmental disclosure and financial performance? Where searches were carried out in the web of science database.

The articles or documents were located based on keywords and terms that characterize environmental disclosure and financial performance, with the search being carried out with the terms in English: environmental disclosure and financial performance. The syntax to be used during the search process in the web of science database will be TS=("environmental disclosure" AND "financial performance"). Where the TS field label refers to the field for the Title, Abstract and Keywords in the case of advanced search for the Web of Science journal base.

Notably, after a detailed review based on the studies of the textual corpus, it was found that some of the studies did not adhere to the themes of environmental disclosure and financial performance and were excluded from the final sample. The survey of the articles that make up the textual corpus was carried out in November 2018. The download of the data, along with the bases, of the selected articles was carried out on December 2, 2018.

It is worth noting that the systematic literature review process based on the process developed by the aforementioned authors is composed of three phases, known as: (i) Review Planning; (ii) Conducting the Review, and (iii) Disseminating Knowledge.

In the first phase, there is the planning of the review, which seeks to elaborate the research protocol, in addition to attributing objectivity to the descriptions of the steps performed. Elements such as the research question, population and sample, strategy adopted for inclusion and exclusion of studies in the systematic literature review are part of the research protocol.

In the second phase, a comprehensive and impartial search is performed based on the search string, based on the identification of the two keywords, related to the thematic axes defined for this research, according to the steps defined in Figure 1.

Fig. 1 - Flowchart of the collection of articles from the Textual *Corpus*

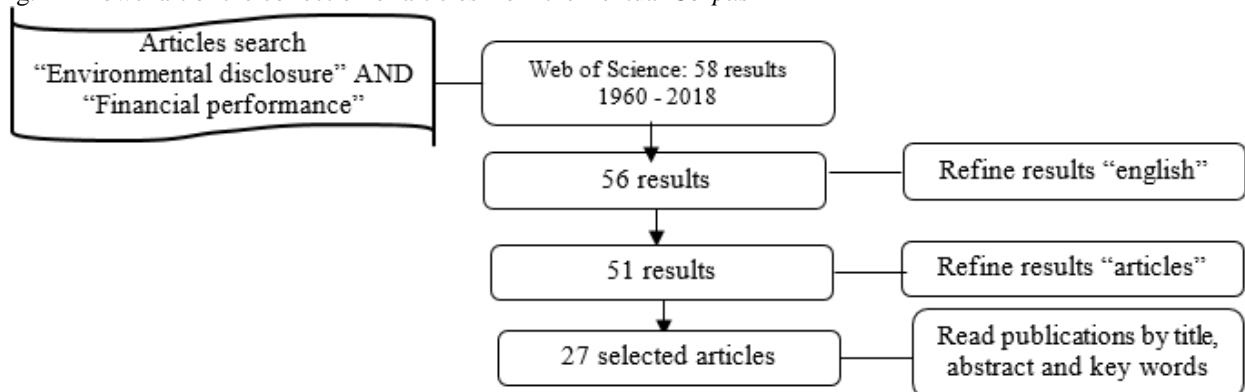


Figure 1 presents the total number of articles found, as well as the search strategy, which consisted of relevant scientific publications, focusing on the research problem raised for this study. The period of publications found was 58 years (1960 to 2018).

Thus, a priori the temporal period for choosing the articles was not delimited, which makes it possible for all studies already published on the investigated topic to have the same chance of being located, composing a probabilistic stratum defined by the composition of filters. After the inclusion of the criteria through the filters, it is expected to compose the final sample in a smaller amount than was extracted in the first search filter originating from the Web of Science.

In the third phase, referring to the execution of the research, divided into detailing and deepening, it is sought to read the abstracts, as well as each of the selected articles. After finding that some studies assess only voluntary disclosure, for example, which is not the focus of this research, it was decided to exclude it, thus defining the effective sample of this research, 27 articles distributed in the period between 2006 and 2018.

4 PRESENTATION AND ANALYSIS OF RESULTS

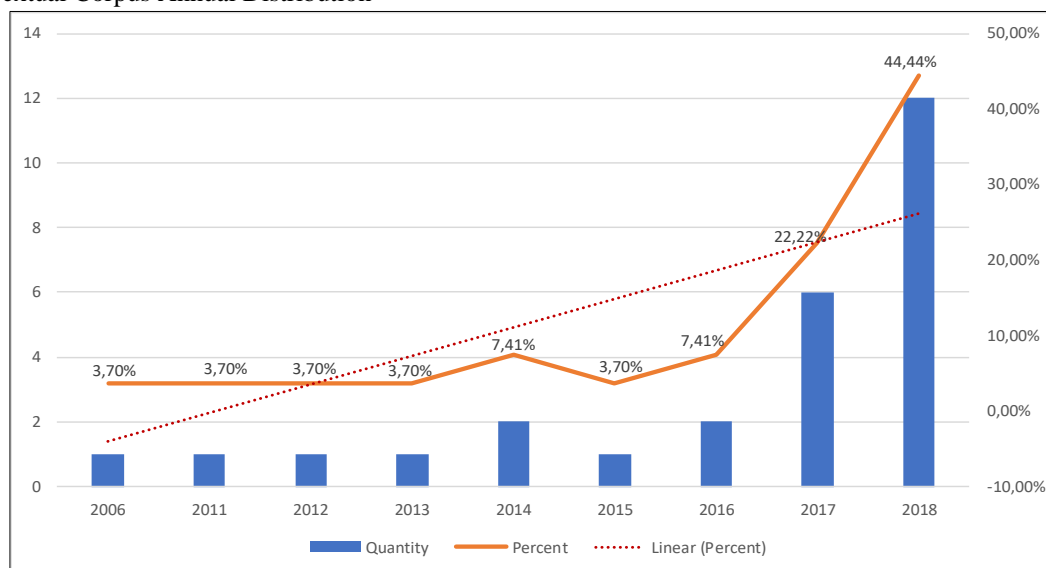
In this section, we seek to investigate the results obtained through the selection of the textual corpus, highlighting the results of a bibliometric study supported by citation indicators, received by authors and journals.

4.1 TEMPORAL DISTRIBUTION OF THE TEXTUAL CORPUS

A total of 27 articles were found that make up the textual corpus, distributed in the time period between 2006 and 2018. Figure 2 shows the distribution of the scientific productions of the 70 authors that are related to the researched topic over time. Based on Figure 2, there is a stagnation of scientific production between the years 2006 and 2013 with only 1 work published annually. It is worth mentioning in this interval the pioneering work developed by Cho; Patten and Roberts (2006), entitled *Corporate political strategy: An examination of the relation between expenditures, environmental performance, and environmental disclosure* and which was published in the *Journal of Business Ethics*, where it obtained a total of 83 citations.

The years 2014 and 2016, respectively, were marked by the publication of 2 scientific papers, in each year, which corresponds to 7.41% of the total publications in the entire period of analysis. Considering the time period from 2006 to 2016, it can be seen that only 9 works had been published in 7 years, which corresponds to 33.33% of the works published in different journals, which proves that the topic explored is very incipient.

Fig. 2 - Textual Corpus Annual Distribution



The years 2017 and 2018, respectively, were those in which the subject evaluated began to be explored more intensively, as a total of 18 works were published in those 2 years, which corresponds to 66.67% of all published articles. throughout the investigation period, which denotes, through the upward trend line, the interest of researchers in exploring this still recent theme.

4.2 AUTHOR CO-CITATION ANALYSIS

The co-citation analysis carried out in this work aims to map the frequency with which two authors or documents from the researched literature are jointly cited by some other more recent author (SMALL, 1973).

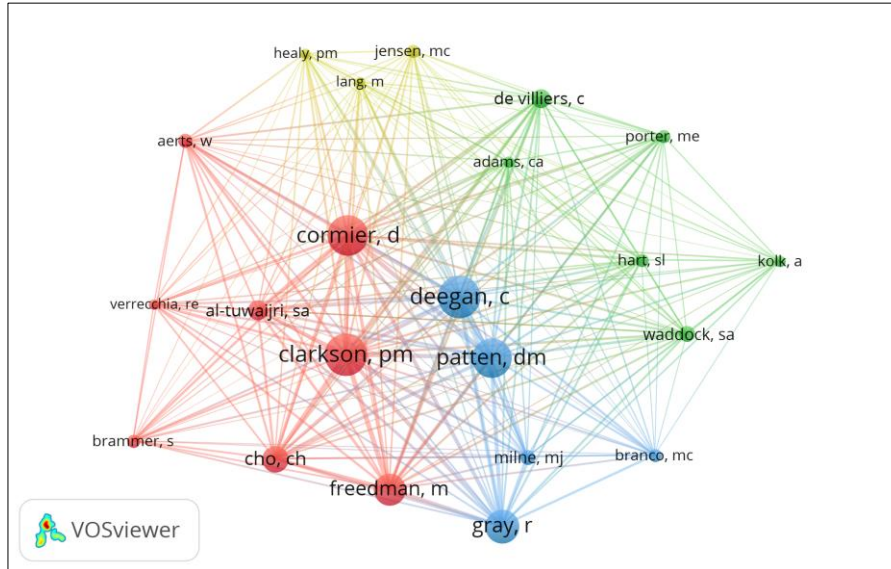
Thus, two authors are said to be co-cited if there is a third that cites them together. Thus, Van Eck and Waltman (2014) show that the greater the number of documents in which two authors or even two documents are co-cited, the stronger the co-citation relationship between these authors or documents will be.

The clustering process uses the implementation of the mapping algorithm (VOS), which seeks to minimize the distance between similar elements. For Van Eck and Waltman (2010), the strength of association of co-occurrences is weighted by the number of times the word appears. For each co-occurrence, the most relevant terms are selected based on the number of times they were cited.

Figure 3 was elaborated with the help of the VOSviewer software, in which the type of analysis chosen was “co-citation”, with the unit of analysis being “cited authors” and the counting method “full counting”, assigning the same weight. for each link between the co-cited authors. In addition, a minimum number of 8 citations was defined for each author, which is the configuration

that allowed the best visualization of the network, resulting in 22 nodes, extracted from a total of 1,208 authors.

Fig. 3 - Author Co-Citation Network.



It can be seen in Figure 3 that the formation of the 4 clusters is constituted as follows: the red cluster is composed of 8 nodes, the green cluster is composed of 6 nodes, the blue cluster has 5 nodes and the yellow cluster is composed of 3 we. Additionally, the more relevant the authors are in their respective groupings, the larger the size of the spheres will also be.

Table 1 shows in detail the authors' co-citation network, highlighting the title of the articles, the journal to which the work was published, the year of publication, the number of citations received and the number of publications. relational ties between the authors who make up the textual corpus.

It can be seen from Table 1 that, in general, the studies investigated based on the formulation of their clusters present a very close theoretical relationship, and that there is convergence in the citation of classic authors on the subject under study, evidenced by the relationship between them.

When analyzing the amount of relational ties between the most co-cited authors, it was noticed that the most prominent authors were Clarkson et al. (2008), with the work entitled Revisiting the relation between environmental performance and environmental disclosure: an empirical analysis discretionary disclosure, which obtained a total of 616 relational ties in the red cluster, being published in Accounting, Organizations and Society. In this work the authors aimed to develop a content analysis index based on the Global Reporting Initiative sustainability reporting guidelines to assess the extent of discretionary disclosures in environmental and social responsibility reports.

Table 1. Network of the most co-cited authors in the Research *Corpus*

Co-cited authors	Article title	Source title	Year	Citation	Total link strength	Cluster
Cho, C. H., Patten, D. M., & Roberts, R. W.	Corporate political strategy: an examination of the relation between political expenfitores, environmental performance, and environmental disclosure	Journal of Business Ethics	2006	22	366	1
Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P.	Revisiting the relation between environmental performance and environmental disclosure: an empirical analysis discretionary disclosure	Accounting, Organizations and Society	2008	37	616	1
Verrecchia, R. E.	Discretionary disclosure	Journal o f Accounting and Economics	1983	8	166	1
Brammer, S., & Pavelin, S.	Voluntary environmental disclosures by large UK companies	Journal of Business Finance & Accounting	2017	10	134	1
Cormier, D., & Magnan, M.	Environmental reporting management: a continental European perspective	Journal o f Accounting and Public Policy	2003	35	564	1
Aerts, W., & Cormier, D.	Media legitimacy and corporate environmental communication	Accounting, Organizations and Society	2009	11	189	1
Al-Tuwajjri, S. A., Christensen, T. E., & Hughes II, K. E.	The relations among environmental disclosure, environmental performance, and economic performance: a simultaneous equations approach	Accounting, Organizations and Society	2004	16	277	1
Freedman, M., & Jaggi, B.	Carbon dioxide emissions and disclosures by eletric utilities	Advances in Public Interest Accounting	2004	27	448	1
Adams, C. A., Hill, W. Y., & Roberts, C. B.	Corporate social reporting practices in western europe: legitimating corporate behaviour?	British Accounting Review	1998	9	171	2
De Villiers, C., & Van Staden, C. J.	Where firms choose to disclose voluntary environmental information	Journal of Accounting and Public Policy	2011	15	236	2
Hart, S. L., & Ahuja, G.	Does it pay to be green? an empirical examination of the relationship between emission reduction and firm performance	Business Strategy and the Environment	1996	10	188	2
Kolk, A.	Trends in sustainability reporting by the fbrtone global 250	Business Strategy and the Environment	2003	9	99	2
Porter, M. E., & Van der Linde, C.	Toward a new conception of the environment-competitiveness relationship	Jorunal of Economic Perspective	1995	10	158	2
Waddock, S. A., & Graves, S. B.	The corporate social performance-financial performance link	Strategic Management Journal	1998	13	192	2
Branco, M. C., & Rodrigues, L. L.	Factors influencing social responsibility disclosure by portuguese companies	Journal of Business Ethics	2008	10	134	3
Deegan, C., & Rankin, M.	Do australian companies report environmental news objectively?	Accoonting, Auditing & Accountability Journal	1996	37	514	3
Gray, R., Kouhy, R., & Lavers, S.	Corporate social and environmental reporting a review of the literature and a longitudinal study of UK disclosure	Accoonting, Auditing & Accountability Journal	1995	29	451	3
Hackston, D., & Milne, M. J.	Some determinants o f social and environmental disclosures in New Zealand companies	Accoonting, Auditing & Accountability Journal	1996	12	218	3
Patten, D. M.	Intra-industry environmental disclosures in response to the Alaskan oil spill: a note on legitimacy theory	Accounting, Organizations and Society	1992	34	528	3
Healy, P. M., & Palepu, K. G.	Information asymmetry, corporate disclosure, and the capital markets: a review of the empirical disclosure literature	Journal of Accounting and Economics	2001	8	145	4
Jensen, M. C., & Meckling, W. H.	Theory of the firm: managerial behavior, agency costs and ownership structure	Journal of Financial Economics	1976	10	118	4
Lang, M., & Lundholm, R.	Cross-sectional determinants of analyst ratings of corporate disclosures	Journal of Accounting Research	1993	8	150	4

Regarding the green cluster, the highlight was the work developed by Roux, De Villiers (2020), called *Where firms choose to disclose voluntary environmental information*, where it obtained a total of 236 relational ties and which was published in the *Journal of Accounting and Public Policy*. In this work, the authors sought to compare annual reports that contained measures of environmental performance and short- and long-term site performance.

In the blue cluster, one of the highlights is the work developed by Gray, Kouhy and Lavers (1995), entitled *Corporate social and environmental reporting: a review of the literature and a longitudinal study of UK disclosure*, having obtained a total of 451 relational ties and which was published in *Accounting, Auditing & Accountability Journal*. In this work, the authors review the literature and longitudinally analyze UK corporate social and environmental reporting practices.

Regarding the yellow Cluster, one of the outstanding works was developed by Lang and Lundholm (1993), entitled as *Cross-Sectional Determinants of Analyst Ratings of Corporate Disclosures*, where a total of 150 relational ties were obtained and it was published in the *Journal of Accounting Research*, where the authors carried out an empirical application examining companies' disclosure practices, providing evidence about the size of the firm and its performance.

The previously evaluated co-citations demonstrate the existence of similarity, complementarity, overlap or even opposition of ideas in relation to the co-cited references. In this sense, the analyzed studies present a very close theoretical relationship, and that there is a convergence in the co-citation of classic authors on the subject under study, thus demonstrating a relationship between them.

Finally, the analysis of co-citation of authors based on Table 1 and Figure 3, allows the identification of the main theoretical trends developed in the field studied, in addition to revealing existing connections between the main authors, verified both by content analysis, and by the number of relational ties that the authors who publish jointly show.

4.3 WORD CLOUD AND SIMILARITY ANALYSIS

The word cloud formulated in this research concerns the organization and graphic grouping of the set of words according to their frequency or occurrence, which allows, in a quick way, the identification of the lexical content and the representational centrality of the corpus. The articles were selected and the free software IRAMUTEQ (Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires) was used, which is a tool that is anchored in the R software and allows different forms of analysis of the textual corpus such as the classical lexical analysis through word cloud and similitude analysis (CAMARGO; JUSTO, 2013).

Similarity, in turn, is based on graph theory and lexometry, allowing the identification of co-occurrences between words and its result brings indications of the connectedness between them, helping to identify the structure of the representation based on Zipf's law. (1945). It can be seen in Figure 4 that the word cloud was extracted from the titles, abstracts and keywords of the authors of the 27 articles comprising the textual corpus.

Fig. 4 - Corpus Word Cloud

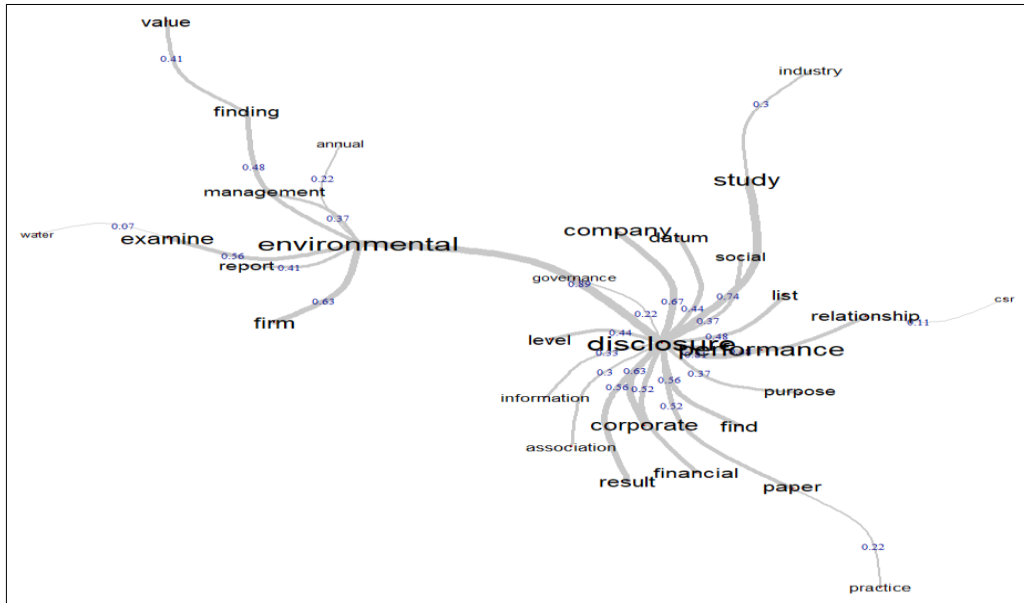


We emphasize that the larger and more centralized a given word is in the cloud, the greater the degree of its evocation by the subjects. On the contrary, the further away and the smaller its size, the lower its degree of evocation will be Camargo and Justo (2013).

We used 262 words that were extracted from the research corpus with the highest frequency of occurrence, corresponding to 43.60% of the total number of words evaluated. It can be seen that the 10 words that stood out the most in the cloud were: 1) Disclosure: 131 occurrences (5.52%); 2) Environmental: 124 occurrences (5.23%); 3) Performance: 91 occurrences (3.83%); 4) Firm: 59 occurrences (2.49%); 5) Company: 57 occurrences (2.40%); 6) Study: 46 occurrences (1.94%); 7) Corporate: 40 occurrences (1.69%); 8) Financial: 37 occurrences (1.56%); 9) Relationship: 30 occurrences (1.26%); and, 10) Report: 29 occurrences (1.22%).

For the formulation of the similarity graph shown in Figure 5, we used the same parameters of the word cloud based on the textual corpus.

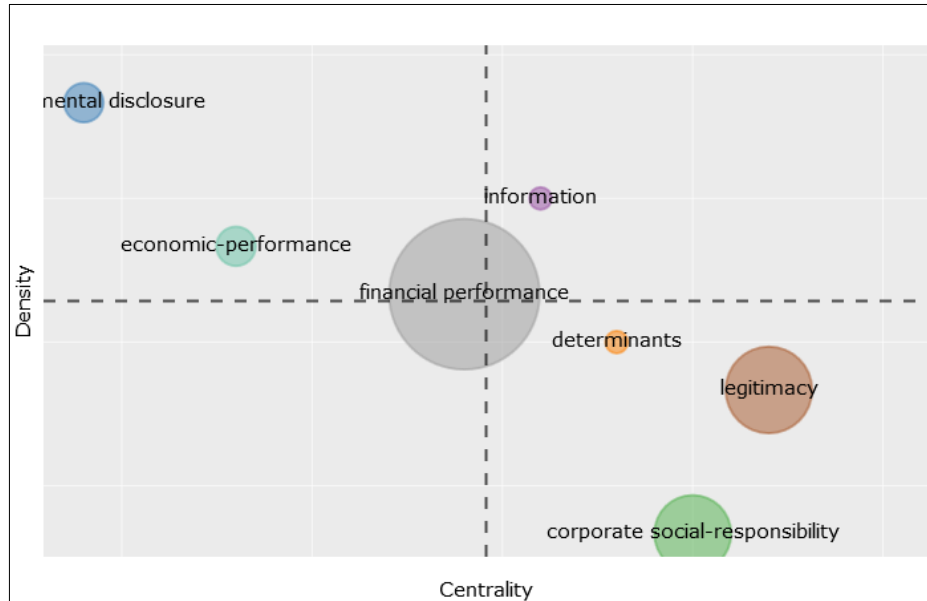
Fig. 5 - Corpus Similarity Graph



Regarding the similarity graph visualized in Figure 5, it is based on graph theory, which makes it possible to identify co-occurrences between words and its result brings indications of the connection between them, helping to identify the representation. In this graph it is possible to verify the connection between the main words and the network built by them, being a complement to the word cloud. Notice the occurrence of a semantic range of words, where the main one that forms the nucleus was the “Disclosure” that shows greater intensity of connection between the nodes, expressed by the thickness of the line that connects them with the other words. Also note that the words that link to the head are coincident with those found with greater expression in the word cloud.

Based on the selected keywords, a thematic mapping of the researched field was also carried out, as described in Cobo et al. (2011), where the authors suggest the construction of a thematic map, considering the most evident terms in the analyzed textual corpus, related to density and its centrality, as shown in Figure 6

Fig. 6 - Strategic diagram of density and centrality of the terms evidenced in the *Corpus*



The terms located in the upper right quadrant (first quadrant) of Figure 6 represent themes characterized as “engines”, being linked to well-developed and important areas, having a high degree of centrality and density for the structuring of a research field. In the case of this work, the term “information” appears in this classification.

The themes located in the upper left quadrant (third quadrant) represent themes characterized as "specialized" that, in this work and, based on Figure 6, appear the terms called "economic-performance" and "environmental disclosure". Furthermore, in the lower left quadrant (fourth quadrant) are the themes characterized as “emerging” or themes that are “disappearing”. In the analyzed textual corpus, themes entirely classified in this category were not evidenced. Finally, in the lower right quadrant (second quadrant) are the themes characterized as "Base", which are considered important for the development of a scientific field, being these more generic and transversal, the themes of this research that encompass such typology are "legitimacy” and “determinants” and “corporate social-responsibility”, when considering the terms of the analyzed textual corpus that are in this category.

5 CONCLUSIONS AND RECOMMENDATIONS

The systematic review presents conclusive results compared to studies already carried out on the subject, based on data that demonstrate such results. In this context, the objective was to establish a systematic literature review of the relationship between environmental disclosure and financial performance published in the web of science journals. It should be noted that the

development of the systematic literature review process enables the identification, mapping and analysis of relevant research on a specific problem or research topic.

Although the research is still incipient, it is of extreme academic relevance, since the journals where the articles in the research corpus are published stand out in terms of qualification metrics. This is relevant because it measures the visibility and prestige of journals.

The areas of greatest concentration of research are environmental science and business. In addition, themes of greater importance and relationship were identified, with financial performance being the central theme that stands out within the textual corpus analyzed, thus corroborating the idea that from disclosure, even if voluntary in environmental reports, arouses interest investment by stakeholders.

This proposition is complemented by the words: disclosure, financial and investor, which were more prominent in the textual corpus, in addition to the proximity between them presented in the density graph. The larger and more centralized a given word is in the cloud, the greater the degree of its evocation by the subjects. In the word cloud, the emphasis is on disclosure, environmental and performance, evidencing the relationship between the subjects of the study.

It was noticed that the Disclosure and Performance themes are, indeed, comprehensive and present several possibilities of approach in the academic scope. In this way, the research question was answered. As a limitation, there is the filtering of the themes carried out from the title, due to the large number of existing publications, so future research can explore the subject further, addressed in addition to the title, abstract and keywords. As well, from the results obtained, future research can direct a meta-analytic study, enabling the summarization of data from a large number of studies that could not be addressed in a narrative literature review.

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