MAPPING FUTURE TRENDS IN INTEGRATED REPORTING, CSR AND BUSINESS SUSTAINABILITY RESEARCH. A CLUSTER BASED APPROACH

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Introduction

This paper aims to investigate the dependence and independence between the variables inferred in the bibliometric analysis of the literature on corporate social responsibility (CSR), business sustainability (BS), and integrated reporting (IR).

The bibliometric analysis developed in this paper is noteworthy because it reveals new research streams that will address similar themes, thus representing a real support in shaping the research strategy.

In order to achieve this aim, the following main objectives were set:

01
To perform a bibliometric analysis of scientific papers indexed by Web of Sciences (WoS) and SCOPUS, with the aforementioned topic, using the cluster method.

02
To employ a statistical analysis of the variables considered in the bibliometric analysis in order to establish correlations between key concepts that define BS, but which have been insufficiently researched or not researched at all.

Literature review

Ackerman, 1975; Freeman, 1984.

Serafeim, 2014: De Villiers et al., 2017.

Harjoto et al., 2018; Cosmulese et al., 2019.

Mion et al., 2019; Di Vaio et al., 2020.

Bartolacci et al., 2020; Kostenko et al., 2021.

IoSDA, 2009; GRI, 2020; IIRC, 2021

Research methodology

STAGE 1: Data collection

• **Database:** Web of Science Core Colection • **TOPIC:** integrated reporting • **Analsysis period:** 1975 – July 2021	**Database:** SCOPUS **TOPIC:** integrated reporting **Analsysis period:** 1975 – July 2021

Inclusion criteria: Research areas: Management, Business Finance, Business, Environmental Studies, Economics, Social Sciences Interdisciplinary; (WoS). Business, Management, Accounting; Economics, Econometrics and Finance, Social Sciences (SCOPUS).
Documents type: Article; Proceedings Papers; Review Article; Books; Book Review; Book Chapter; **Social Sciences Citation Index; All languages**;

Exclusion criteria: Research areas: all other areas not mentioned above.
Document type: editorial material, letters, corrections, abstract meetings and notes.

➢ **180 articles**	**422 articles**

STAGE 2: Bibliometric analysis

- VOSviewer all keywors co-occurrence analysis to Full Counting and Method Association Strenght
- VOSviewer co-authorhip analysis on authors using Full Counting and Method Association Strenght;
- VOSviewer co-authorhip analysis of organizations; Full Counting, Method Association Strenght;
- VOSviewer co-authorhip analysis of countries and visualization maps to Microsoft 365 (2019);

STAGE 3: Statistical analysis

- Developing a behavior model of research clusters by using the least squares method and the logarithm function of SPSS v26;
- The basis of the model was an equation for estimating the nonlinear multiple regression model, of the Cobb-Douglas type production function type.

STAGE 4: Conclusions

Results and discussions

Topics searched on WoS	Research results	Topics searched on SCOPUS	Research results	Total
CSR and Stakeholders	922	CSR and Stakeholders	1980	2902
Stakeholders and BS	20	Stakeholders and BS	47	67
Stakeholders and IR	43	Stakeholders and IR	127	170
IR and CSR	43	IR and CSR	47	90
IR and Business model	13	IR and Business model	28	41
CSR and BS	31	CSR and BS	35	66
Total	1062	Total	2264	3326

Table 2 - Frequency-based keyword association ranking - Web of Sciences and SCOPUS

Based on the search protocol applied on the WoS database, 180 papers for the selected period were returned and imported into the VOSviewer software. VOS selected 737 terms of which only 89 reached the threshold of at least 5 frequencies for WOS and 44 for SCOPUS.

Results and discussion related to bibliometric analysis

Figure 1- Network of keyword co-occurrences for IR research from WoS (1975-July 2021)

Figure 2 - Network of keyword co-occurrences for IR research from SCOPUS (1975- July 2021)

The top 10 terms highlight that the latest research (2019) emphasize quality in IR according to WOS, however, on SCOPUS the focus is on integrated thinking. The top 10 items between the two platforms is different but there are common elements such as sustainability, corporate social responsibility, disclosure.

Results and discussion on statistical analysis

After testing the main aggregated bibliometric indicators through the estimation equation of the nonlinear multiple regression model, of the Cobb-Douglas production function type, we obtained the following model of research cluster behavior:

$$cluster = \beta\ TL^{\alpha_1}\ L^{\alpha_2}\ O^{\alpha_3}\ C^{\alpha_4}\ NC^{\alpha_5}\ e^{\varepsilon}$$

Where:

1 Cluster - represents the group/cluster of key concepts orbiting around the IR topic (dependent variable);

2 TL - Total Links established between all key concepts present in all clusters (independent variable);

3 L – The links between key concepts within a cluster (independent variable);

4 O – the frequency of each key concept (independent variable);

5 NC – represents the most relevant citation rate (independent variable);

6 C - the number of citations related (independent variable);

7 E – random or residual variable;
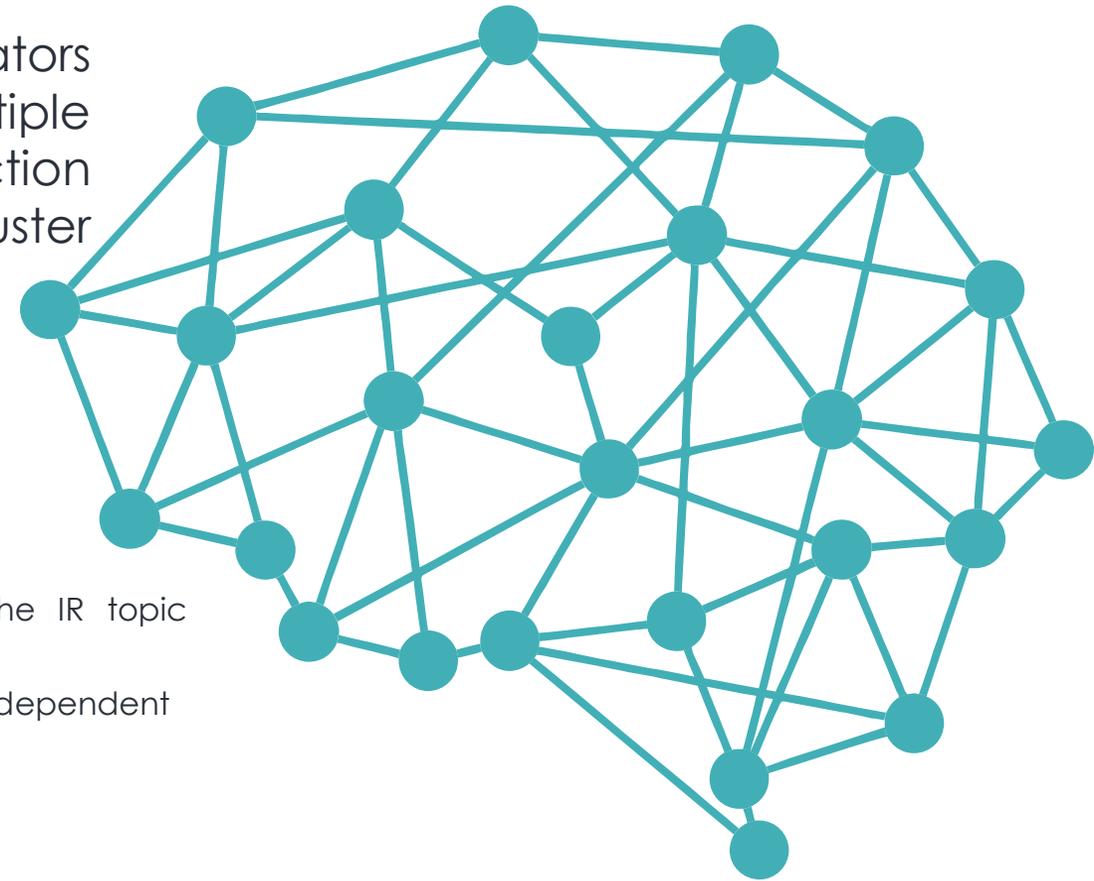
8
- β - regression coefficient showing the mean value of the dependent variable Cluster
- are the $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5$ elasticities of the dependent variables.

| Model		Unstandardized Coefficients		Standardized Coefficients	t	Mr
		B	Std. Error	Beta		
1	(Constant)	4.547	.056		81.291	.000
	LN(Totallinks)	-1.139	.089	-1.277	-12.805	.000
	LN(Links)	.056	.089	.052	.625	.532
	LN(Occurrence)	1.075	.033	.985	32.812	.000
	LN(citations)	-.345	.014	-.369	-24.788	.000
	LN(norm. citations)	.553	.019	.344	28.441	.000
a. Dependent Variable: LN(cluster)						

Estimation of the regression model

According to the multiple nonlinear regression model, we can see that as the strengths of links between keywords within the same research cluster increases, their frequency (occurrences), along with normalized citations (which represents the normalized number of citations received by keywords related to the IR topic), implicitly leads to a strengthening of the cluster of origin, in the sense that citations are more concentrated on certain niches (the normalized number of citations received by a document or the total normalized number of citations received by all documents published by a source, author, organization or country). At the same time, we note that an augmentation of the bibliometric indicators Total Links and Citations will result in a reduction in the number of research clusters, i.e. a concentration of researchers on topics focused on those key concepts that have a significant influence on the research topic, will reduce the dilution of research streams and, at the same time, will validate the above statement, i.e. the concentration of research on well-established areas.

1 $$cluster = e^{4.547}\, T^{-1.139}\, L^{0.056}\, O^{1.075}\, C^{-0.345}\, NC^{0.553}$$

OR

2 $$cluster = 94.36149\, T^{-1.139}\, L^{0.056}\, O^{1.075}\, C^{-0.345}\, NC^{0.553}$$

Conclusions

The findings are embodied in a statistical model to assess the frequency and linkages between the concepts / keywords most commonly used in the papers analyzed and obviously to identify unexplored research niches on this topic, but from the perspective of less well-defined clusters.

The importance of this findings lies in the

fact that they can be particularly useful to researchers who want to address new research paths on the topic of CSR, sustainability, and IR, because using the statistical model developed in our paper the links between key variables influencing CSR, sustainability and IR can be easily and reliably identified and new research insights into the sustainability of business models may be unveiled.

Conclusions
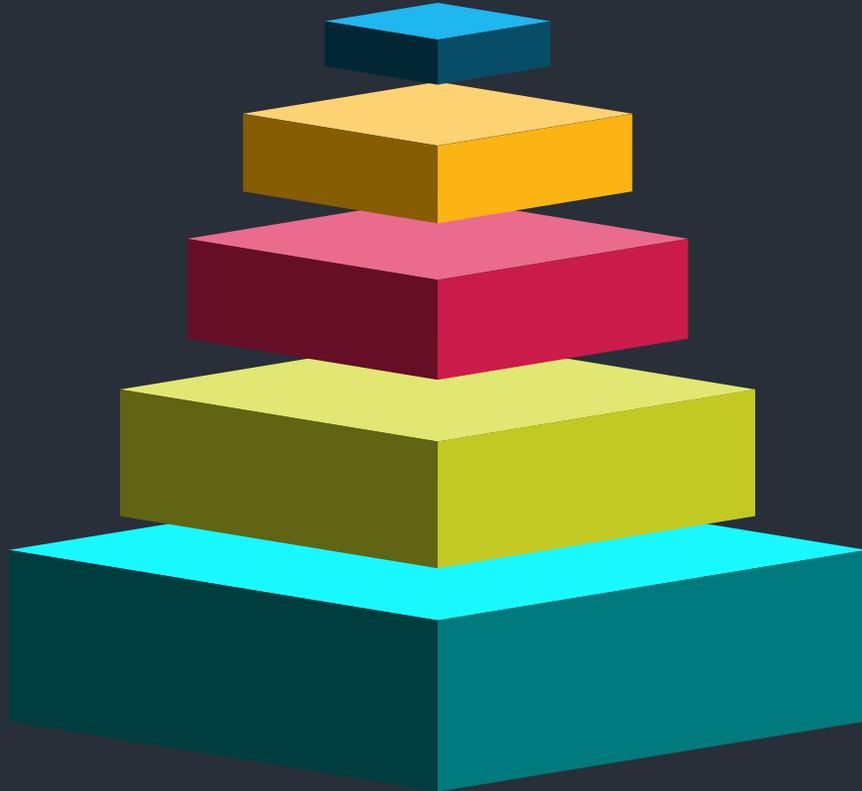
1 The model developed allows for mapping future research trends that, unlike the pre-2020 period, are more pronounced towards the social domain, captured by key terms such as health crisis, COVID-19, human capital, but also towards the environmental issues (environmental performance, global warming, recycling, etc.).

2 IR is an interdisciplinary topic shaped by research including today's most used keywords such as CSR, sustainability, BS, business model, non-financial reporting, etc. found in many research areas.

3 IR research is influenced by the ongoing socio-economic context, with an increasing number of published papers linking IR to the health crisis, seen as the best tool to inform stakeholders about the effects of the pandemic on companies' economic operations.

Thanks for your attention!