The Balanced Scorecard: A Bibliometric Approach

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Abstract

The Balanced Scorecard is a strategic analytical model that helps organizations align their strategy with their performance measures and objectives and provides a comprehensive view of an organization's performance by looking at four key perspectives: financial, customer, internal process, and learning and growth. This paper focuses on a bibliometric analysis that was performed using the VOSviewer program and the Biblioshiny program. Thus, three sets of documents from the Web of Science database in the fields of Management and Economy were considered, over three time periods and, respectively: 2000-2010, 2010-2020, and 2000-September 2022. Moreover, the research focused on the evolution over time of the "balanced scorecard" concept, the analysis of keywords, and the number of citations of the selected documents. The conclusions indicate that there is great interest in the research of this concept, but also for other concepts related to the concept of 'balanced scorecard', the evolution being considerable from one period to another, up to the year 2019. This research also presents an original point of view, regarding the concept of the 'balanced scorecard', considering the limited existence of bibliometric works on this subject. Moreover, this study can contribute to the development of the existing literature from this field.

Introduction and research background

Performance refers to the ability of an individual or organization to achieve its goals and objectives. Performance measurement and evaluation is also important because it helps organizations identify areas for improvement and track progress over time, allocate resources effectively, and make the right decisions. It can be measured through various means, such as performance evaluations, self-evaluations, and quantitative metrics, such as productivity and efficiency.

The "Balanced Scorecard" represents an analytical model of strategic information developed by Kaplan and Norton (1992). Since then and until now, this model has been the subject of many research studies on its utility as a strategic management (Bigliardi and Ivo Dormio, 2010). The basic premise of this model is quite simple. Unlike traditional performance measurement systems, which have financial controls at their core, the balanced scorecard starts with the vision and strategy of an organization. To translate vision and strategy into performance measures, it is necessary to determine objectives in each of the four perspectives of the Balanced Scorecard (Niven, 2005): (1) financial, (2) customer, (3) internal processes, and (4) learning and development of employees.

Our searches show that there have been numerous studies that examine the integration of the balanced scorecard concept with other fields, such as artificial intelligence (Żółtowski, 2022) and supply chains (de Sousa et al., 2020). Bibliometric studies carried out exclusively on the concept of "balanced scorecard" are limited, most studies (Mishra, et al., 2018; Garengo and Sardi, 2021) focus more on the analysis of multiple concepts related to performance measurement (or performance in general), and not just on the concept of "balanced scorecard". Also, a single bibliometric analysis was carried out by Ribeiro et al. (2020) on the scientific production of the "balanced scorecard" concept in the public sector, and the results of the study can be analysed with the results of our study.

Given the limited number of studies that have evaluated the balanced scorecard concept using bibliometric analyses, it is crucial to highlight the importance of this field in current management research. To address this gap, we propose two research questions that will provide relevant insights into the current state of research on the balanced scorecard and its impact on performance measurement and evaluation. By answering these questions, we hope to emphasize the significance of this field and its potential for future research. Therefore, the two research questions are formulated as:

Q1: What is the current state of research on the balanced scorecard and how has it evolved over time in the field of management?

Q2: What are the key findings and trends in research on performance measurement and evaluation?

Thus, considering the mentioned aspects, the purpose of this study is to observe the evolution over time of the "balanced scorecard" concept, and to observe which were the most cited works in the field of management and economics. Last but not least, to analyze the connections of the concept with other concepts in the targeted field.

Following this, we suggest outlining the methodology that will guide this study, followed by the data analysis phase. Specifically, we will describe the data collection method that will be used for the bibliometric analysis and the analytical approach that will be employed to study the data. This will enable us to use appropriate tools to analyze the dataset in the subsequent stage.

1. Materials and methods

To observe the evolution over time of the concept of "balanced scorecard", also to analyze the keywords for documents related to this concept, and to be able to identify the documents with the highest number of citations (considering a specific set of documents), we used the VOSviewer (Van Eck and Waltman, 2010) and Biblioshiny programs (Aria and Cuccurullo, 2017). Generally, bibliometric analysis focuses on the characteristics of publications, the impact of citations, the analysis of the countries of origin of the authors, and the analysis of the subjects of scientific documents (Büyükkidik, 2022).

Even Google Scholar is the largest database including scientific production, Web of Science (owned by Clarivate) was selected since it implies more strict inclusion criteria, thus allowing the research to be conducted on a higher quality set of documents (Popa et al., 2023).

For this analysis, three sets of documents from the Web of Science database (selecting the fields of Management and Economics) were taken into consideration, namely: (1) set (a) of documents, composed of publications specific to the period 2000-2010; (2) set (b) of documents, composed of publications specific to the period 2010-2020; and (3) set (c) of documents composed of publications specific to the period 2000-September 2022. The documents were downloaded from the Web of Science platform and imported into the two bibliometric analysis programs. The evolution over time of the concept of "balanced scorecard" was analyzed using all three sets of documents, and the specific keywords related to the concept of "balanced scorecard", as well as the documents with the highest number of citations, were identified using set (c) of documents. To analyze the evolution over time of the concept of "balanced scorecard" and to analyze the keywords for documents related to this concept, both the keywords provided by the authors and the PLUS keywords were taken into consideration. Unlike the keywords provided by the authors, the PLUS keywords refer to the concepts that frequently appear in the titles of cited articles.

2. Data Analysis and Discussion

2. 1 Evolution over time of the "balanced scorecard" concept

To analyze the evolution of the concept of "balanced scorecard," two sets of documents were selected. The fields selected from the Web of Science database were Management and Economics, and the two maps (Figure no. 1 (a) and Figure no. 1 (b)) reflect the connections between the most relevant keywords in the selected scientific documents. The size of each nods indicates the number of appearances of the concepts, and the length of the lines reflects the strength of the connection between two concepts. The maps include both the keywords provided by the authors and the PLUS keywords (words that frequently appear in the titles of cited articles). Although the periods targeted for the analysis of the evolution of the concept of „balanced scorecard" were 2000-2010 (set (a) of documents) and 2010-2020 (set (b) of documents), the VOSviewer program automatically selected the periods with the strongest connections between the concept of "balanced scorecard" and other concepts or phrases (2005-2008 and 2015-2018).

Figure no. 1(a) reflects the specific map of the 2005-2008 period of the connections between the keywords of the first set of documents (651 scientific articles). The map shows the emphasis of 2007 on the keyword "balanced scorecard", the keyword "performance", and the connection between the two concepts. Also, a strong emphasis of 2006 and 2007 on the following connections is noted: "balanced scorecard" - "performance measurement"; "balanced scorecard" - "strategic management"; "balanced scorecard" - "management"; "balanced scorecard" - "strategy". In 2008, the authors' concerns were oriented (to a lesser extent) towards the connections between the concept of "balanced scorecard" and concepts/phrases such as "performance management", "business performance", or "innovation". Furthermore, Figure no. 1(b) deals with the period 2015-2018 and represents the map of connections between the keywords of the second set of documents (1681 scientific articles). For this period, the number of documents is significantly higher than in the previous period. The concept of „balanced scorecard" was used most frequently between 2016 and 2017, and the most important connections are those that existed between the concepts that were emphasized in the previous period. The focus of 2015 on the connections between the concept of "balanced scorecard" and concepts such as "knowledge management" and "strategic management" is notable, and the emphasis of 2018 on the connections between the concept of "balanced scorecard" and concepts such as "decision-making" and "sustainability" is notable.

Set (a) of documents   **Set (b) of documents**
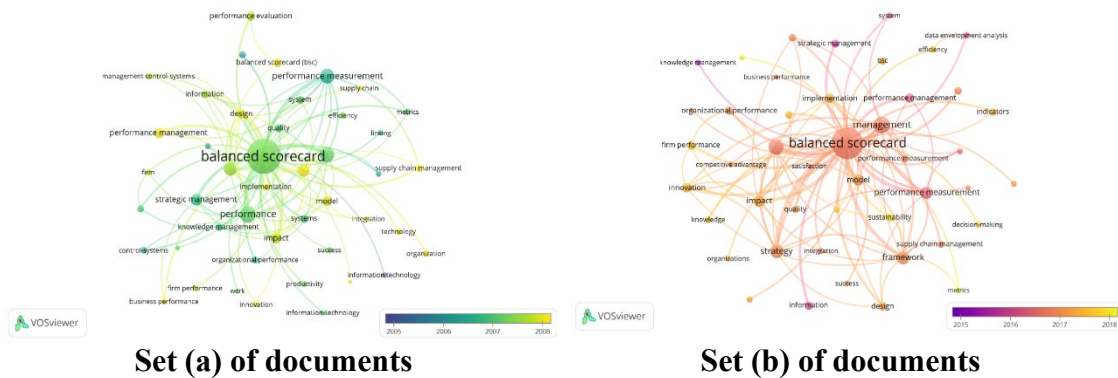
Figure no. 1. Link map between keywords over time
Source: authors with VOSviewer

The two network-type graph maps largely capture similar connections between the concept of „balanced scorecard" and other concepts. However, during the 2015-2018 period, the authors' interest in this concept has increased considerably as we can see in in Figure no. 2. Furthermore, during this period, there was strong interest among the authors in the connection between the concept of balanced scorecard and concepts such as "strategy", "innovation", "strategic management", and "competitive advantage".

In order to be able to observe the evolution of scientific production related to the concept of "balanced scorecard", an analysis of all scientific documents (set (c) of documents) that were published between 2000 and September 2022 (2447 papers) was carried out in the Web of Science database, considering the fields of Management and Economics.
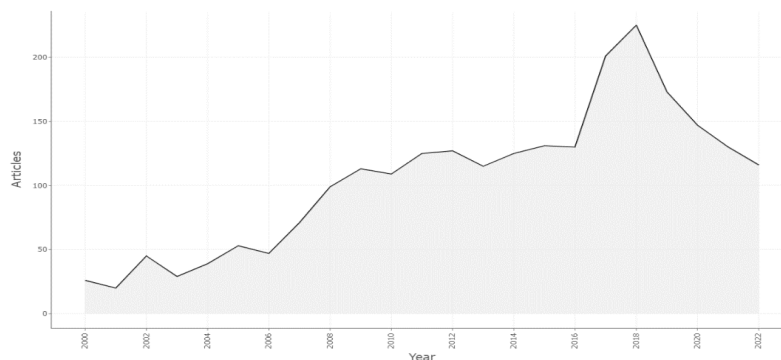

Figure no. 2. Evolution of annual scientific production related to the concept of a "balanced scorecard" (set (c) of documents)
Source: authors with Biblioshiny

The starting period, the period 2000-2003, coincides with the emergence of the first research on the concept of "balanced scorecard", and therefore, as can be observed in Figure no. 2, scientific production was quite

low during this period. From 2004 on, research on the concept of "balanced scorecard" intensified, the number of scientific documents that analyzed this concept reached 125 in 2014, 130 in 2016 and 225 in 2018. Most of the research was conducted in the period 2017-2018, when there were also the most connections between the concept of „balanced scorecard" and other concepts (as can be observed in Figure no. 1). Although there has been a decrease in the number of documents that have analyzed the concept of "balanced scorecard" starting in 2019, there are still research directions that researchers can focus on in the future.

In Figure no. 3, it can be observed how scientific production related to the concept of "balanced scorecard" has evolved in the period 2000-September 2022, this time considering the country of reference of the authors (the program automatically selected the top 6 countries with the highest volume of scientific documents related to the concept of „balanced scorecard"). Most of the documents that analyzed this concept came from China (577 scientific documents) and the United States (405 scientific documents). Compared to the other 4 countries (United Kingdom, Spain, Brazil, and Australia), in China and the USA, there has been a rapid increase in research on the concept of "balanced scorecard", especially after 2010. Among the countries analyzed, the least scientific documents that referred to the concept of "balanced scorecard" were recorded in Australia (183 documents) and Brazil (184 documents).
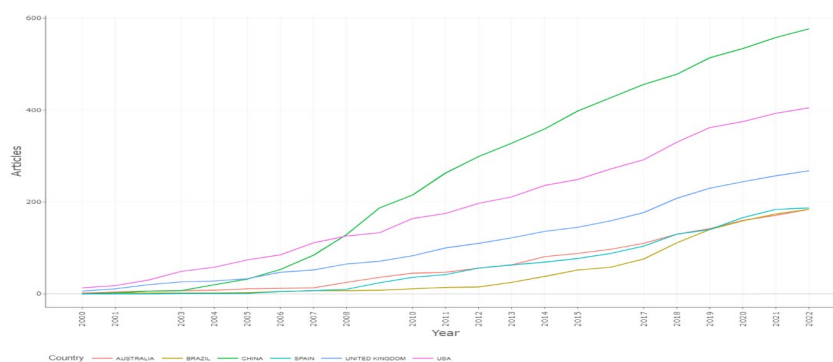

Figure no. 3. Country productivity over time of balanced scorecard documents (set (c) of documents)
Source: authors with Biblioshiny

2.2 Analysis of keywords for documents related to the concept of "balanced scorecard"

The specific keywords of the documents related to the balanced scorecard concept can be seen in Figures no. 4 and 5. Furthermore, Figure no. 4 represents a tree of the 50 most frequent keywords provided by the authors. The concept of "balanced scorecard" represented one of the keywords of the authors in 816 papers out of the 2447 analyzed, having a weight of 28%. The next three most frequent authors' keywords were "performance measurement" (weight 9%), "performance management" (weight 5%), and "performance" (weight 3%). Instead of the concept of "balanced scorecard", the authors also used concepts such as "bsc" (weight 2%), "balanced scorecard (BSC)" (weight 2%), and "balance scorecard" (weight 1%).
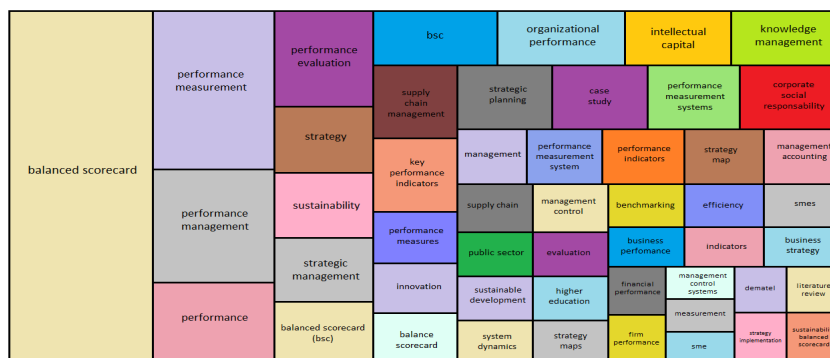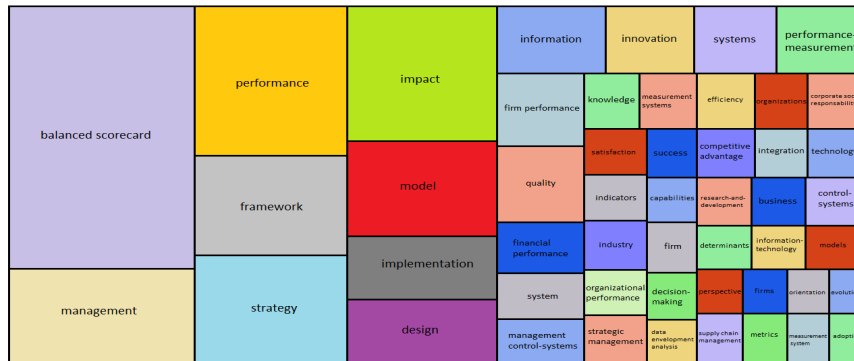

Figure no. 4. Keyword tree of authors (set (c) of documents)
Source: authors with Biblioshiny

Figure no. 5 represents a tree of PLUS keywords. For this analysis, the set (c) consisted of 2447 documents (selected from the Web of Science database), considering the period 2000–September 2022. According to Figure no. 5, the concept of "balanced scorecard" was mentioned 973 times in the titles of the cited articles, having a weight of 20%. The next three most frequent PLUS keywords were "management" (weight 8%),

"performance" (weight 6%), and "framework" (weight 5%). The authors focus on some concepts related to performance, such as: "performance evaluation", "organizational performance", "performance measurement system", "performance indicators", and "key performance indicators", but also on some concepts related to strategy, such as: "strategic management", "strategic planning", "strategy map", "business strategy", and "strategy maps".

Figure no. 5. Tree of keywords PLUS (set (c) of documents)
Source: authors with Biblioshiny

Further we realized Figure no. 6 which represents a map of the keywords (both those provided by the authors and those from PLUS), grouped into clusters of different colours, and also of the links between them. The strongest links are those between the concept of "balanced scorecard" and the following concepts: "management", "performance", "performance measurement", and "strategy". The first cluster (red) contains 23 items. The main element of this cluster is represented by the concept "performance" (number of occurrences: 355), and most of the other elements ("organizational performance", "firm performance", "business performance", "financial performance") are closely related to this concept. Thus, from the links created between the terms, we observe the fact that research has focused on all aspects of performance in an organizational context. The second cluster (green) contains 14 terms, the most frequently used being the concept of "balanced scorecard" (number of occurrences: 1553). The strong connection between the concept of "balanced scorecard" and the concept of "performance measurement" (another item of this cluster) is noted.
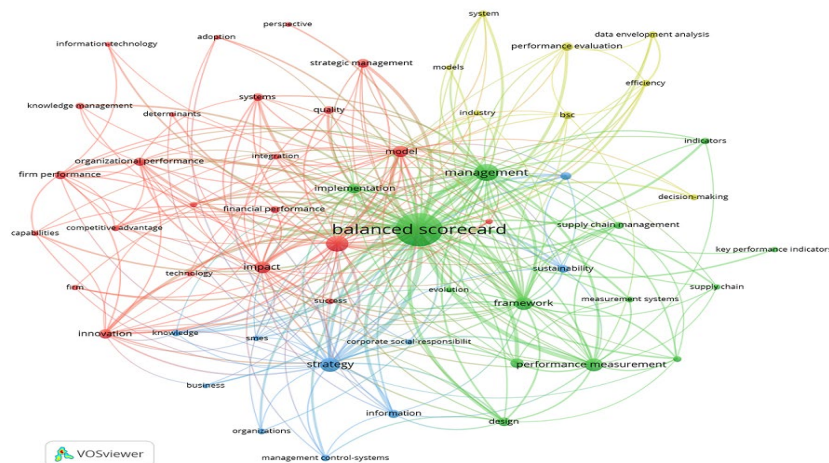
Figure no. 6. Link map between keywords (set (c) of documents)
Source: authors with VOSviewer

Moreover, we also observe links with other terms from the cluster such as "management", "evolution", "sustainability" and others, which confirms the fact that performance measurement is important in an organizational environment because it helps it to achieve its goals and objectives. The third cluster (blue) contains 10 items, its main element being the concept "strategy" (number of occurrences: 280). There are also links with the terms "knowledge", "information", "business" and others, indicating that performance measurement is important to organizational strategy and the direction in which it is heading to achieve its goals. The fourth cluster (yellow) contains the fewest items (8), and the main element of this cluster is represented by the concept "performance evaluation" (number of occurrences: 99) and links to "modes", "efficiency", "BSC" and others. Thus, we accept the idea according to which performance measurement

and evaluation is important because it helps organizations to assess the effectiveness and efficiency of their operations, processes, and strategies.

2.3. Documents with the highest number of citations

In Table no. 1, the titles of the 10 most cited works can be observed. Jensen's work, published in 2002, in the journal Business Ethics Quarterly, has the highest number of citations (961). This work is followed by the work belonging to the authors Malmi and Brown (663 citations), published in 2008 in the journal Management Accounting Research, and the work belonging to the author Saedi et al. (603 citations), published in 2015 in the Journal of Business Research and, also the last work having the lowest number of citations (393). The most cited works are those that were published during the period when the scientific production related to the "balanced scorecard" concept was quite low (1999-2005).

Table no. 1. The 10 most cited articles (set (c) of documents)

No.	Source	Purpose	Methods	Findings
1	(Jensen, 2002)	This article presents a proposal, referred to as "enlightened value maximization," aimed at clarifying the relationship between value maximization and stakeholder theory.	This study takes a qualitative approach to address two research questions: whether a company should have a single goal, specifically value maximization, and whether that goal should be value maximization or value maintenance.	A single-objective function is insufficient to guarantee the success of an organization. The author argued that firms that adhere to conventional stakeholder theory will perform worse in the competition for survival compared to those that follow a clearly defined single objective, such as value creation.
2	(Malmi and Brown, 2008)	The purpose of the study is to examine different definitions of MCS and the challenges they have posed as well as a new classification of MCS.	This study adopts a qualitative approach and examines various definitions of MCS and the challenges they have posed. The paper presents a new categorization of MCS, structured around five groups: planning, cyber, reward, and compensation, administrative, and cultural controls.	The findings suggest that as research advances in this field, there is a need for refinement and improvement of both the conceptual typologies and the constructs within them.
3	(Saeidi, Sofian, Saeidi, Saeidi, and Saaeidi, 2015)	This study aims to test and establish a more intricate relationship between CSR and firm performance by including three mediators, customer satisfaction, reputation, and sustainable competitive advantage.	The approach used is quantitative and involved conducting a survey of opinions. The study targeted 1250 manufacturing and consumer product companies, specifically their managers. Ultimately, only 205 companies participated in the research.	The conclusion shows that only reputation and competitive advantage act as intermediaries between CSR and firm performance. These results indicate that CSR can indirectly enhance firm performance by boosting reputation and competitive advantage, while also increasing customer satisfaction.
4	(Otley, 1999)	This paper presents a framework for analyzing the functioning of management control systems, structured around five key components: objectives, strategies, and plans for attainment, target-setting, incentive, and reward structures, and information feedback loops.	The study employs a qualitative approach and centres on an examination of the dominant theories on the functioning of the proposed framework.	The findings suggest that the utilization of management accounting and control systems can be effectively analysed through the lens of performance measurement and management.
5	(Ittner, Larcker, and Randall, 2003)	This study explores the connection between measurement system satisfaction, economic performance, and two general methods of strategic performance measurement: increased measurement diversity and improved alignment with the firm's strategy and value drivers.	The research used an observation and questionnaire approach, using data from 140 US financial services firms.	The findings indicate that a higher level of measurement diversity in comparison to firms with similar value drivers has a stronger correlation with stock market performance than a higher level of measurement on an absolute scale.

6	(Kaplan and Norton, 2000)	The aim of the paper is to demonstrate the utilization of the map's strategy, which outlines the organization's plan for converting its various assets into desired outcomes.	A literature review with examples of the strategy employed by Mobil North American Marketing and Refining.	Strategy maps help determine when scoreboards aren't really strategic and how to use them.
7	(Chenhall, 2005)	The aim of this study is to expand upon the existing accounting literature by exploring the relationship between the informational dimensions of SPMS and desired organizational outcomes.	Data was gathered through a survey questionnaire given to senior managers from Australia's top 200 industrial organizations.	The findings suggest, three interrelated dimensions of integrative SPMS have been identified that assist managers in developing competitive strategies.
8	(Ittner, Larcker, and Meyer, 2003)	The objective of this study is to investigate how various performance measures were given importance in a subjective balanced scorecard bonus scheme implemented by a major financial services company.	The study employs a quantitative methodology and tests three hypotheses with data from Global Financial Services' North American retail banking operations.	The researchers discovered that the subjectivity in the scorecard plan gave superiors the ability to tilt the balance of bonus awards towards financial measures, at the expense of other measures.
9	(Neely, 2005)	This work provides an update of the literature review by Neely et al. (1995)	The study uses a citation/co-citation analysis of literature in the area of performance measurement to investigate advancements in the field globally.	The paper contends that scholars within the performance measurement field share a consensus on the crucial research questions despite their varying disciplinary backgrounds.
10	(Neely, et al., 2000)	The aim of the research is to determine if a comprehensive process for designing the performance measurement system can be established, and if so, what this process would entail.	A pilot process was applied for the performance measurement system, consisting of 12 stages.	Many managers are currently revising the measurement systems in their organizations, however, few have a systematic approach. Even fewer appear to be actively addressing the issues related to implementing, using, and maintaining the measurement systems they are designing.

Source: authors

Conclusions

The term "balanced scorecard" is a relatively new concept that has received significant attention from researchers, especially in the period 2017-2019. Observing the evolution of this concept over time, it can be concluded that interest in researching this concept, but also in analyzing the links between the concept of "balanced scorecard" and other concepts, has grown considerably from one period to another, until the year 2019. From 2019 to now, the evolution of research on this concept has been downward. This aspect may suggest that the authors' interest has also migrated to other concepts, and there are still multiple future possibilities to research the concept of the "balanced scorecard". At the same time, the network graphs suggest the existence of strong links between the concept of "balanced scorecard" and the following concepts: "management", "performance", "performance measurement", and "strategy". Analyzing the documents with the highest number of citations, the reference work of Jensen (2002) in which the balanced scorecard model is approached as the managerial equivalent of the stakeholder theory, is a reference work.

Although numerous studies have examined this concept, the approaches vary across different sectors, but we believe that the traditional approach of Kaplan and Norton (1992) still holds significant value in the field of management. Other studies have made an impact in the field, however, it is hoped that this research will also contribute to its advancement, as there are limited bibliometric analyses on this concept.

Future research may include studies in other more niche fields, such as health management, or others. Moreover, we believe that comparative bibliometric analyses between databases can also be carried out. The limits of the study being specific to the bibliometric limitations, the quality analysis of these works can be considered.

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