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REVIEW PAPER

# Balanced scorecard: trends, developments, and future directions

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**Abstract**
Balanced scorecard (BSC) is widely studied and practiced. As research on the BSC has matured since its introduction in 1992, it is timely to assess its progress and outline future directions. This study synthesizes extant research and presents avenues to advance the BSC. To accomplish these objectives, we undertake a review employing a bibliometric and systematic methodology on a corpus of 1294 BSC-related studies. The review reveals that the more than 30-year history of BSC research has followed a bell-curve trajectory, with publications appearing in high-quality, multidisciplinary journals and contributions from numerous author groups worldwide. Moreover, the review highlights the evolution of major themes and topics on the BSC, encompassing customer orientation, financial management, integrated reporting, strategic performance management, sustainable development, and systems thinking. Sustainability BSC has also gained prominence due to sustainability firmly establishing itself as a global agenda and grand challenge. Taken collectively, this review serves as a one-stop resource for gaining a state-of-the-art understanding of the trends, developments, and future directions of the BSC.

**Keywords** Balanced scorecard · Bibliometric analysis · Systematic literature review

**JEL Codes** M1 Business administration

## 1 Introduction

> "The balanced scorecard is like a smartphone's health and fitness app, compiling multiple metrics into a single dashboard; it gives managers a comprehensive view of organizational health and guides strategic action"—The authors.

With the continued development of technology, the globalization of the marketplace, and the evolution of stakeholder expectations, the business environment in

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which firms operate within has become increasingly disruptive in addition to being volatile and uncertain as well as complex and ambiguous (DVUCA) (Ciasullo and Lim 2022b, 2023; Pattnaik et al. 2022). Within the DVUCA environment, firms are naturally expected to respond (manage, perform) with agility, purpose, and excellence, thereby accentuating the necessity and importance of strategic performance measurement and management tools that can support firms in meeting this expectation (Lim, Ciasullo et al. 2023).

Developed by Robert Samuel Kaplan and David P. Norton who published in the *Harvard Business Review*, the balanced scorecard (BSC) was introduced and popularized as a strategic tool for performance measurement and management that focuses on

(i) a strategic agenda (i.e., vision, mission),
(ii) a mix of strategic objectives (i.e., economic and non-economic),
(iii) a set of measurements, and
(iv) a portfolio of initiatives designed to meet (i) and (ii).

In this regard, the BSC considers not only

(i) financial performance (i.e., how do shareholders see us?) but also
(ii) customer satisfaction (i.e., how do our customers perceive us?),
(iii) internal business processes (i.e., what must we do well?), and
(iv) innovation and learning (i.e., how can we engage in continuous improvement and value creation?) (Kaplan and Norton 1992).

Therefore, the BSC, which essentially lists and connects strategic objectives against performance measures, can be viewed as a strategic management tool that

(i) operationalizes strategy (vision, mission) into more specific and tangible forms for measurement and management,
(ii) ensures that key (multidimensional) information, both financial and non-financial, are identified, monitored, and actioned upon,
(iii) offers a balanced view of the organization, and
(iv) provides a comprehensive yet succinct overview of strategic progress that complements detailed management (financial, operational) reports.

Nonetheless, like any concept, framework, model, taxonomy, or theory, the BSC has been widely debated, resulting in the advancement of its theoretical foundation and managerial practice.

From a theoretical standpoint, the BSC, in its initial years, was criticized for the lack of empirical evidence and rigor supporting its establishment as a management tool (Norreklit 2000). This has led to a plethora of empirical research, both from Kaplan and Norton as well as other scholars, as noted by an earlier review (Hoque 2014) as well as our present review of the BSC. Substantial enhancements in the theoretical exposition of the BSC have since been made. One such enhancement is the articulation of the links between strategic objectives that play a pertinent and

profound role in the strategic linkage model or the strategy map, which is a distinction of the second-generation BSC (Kaplan and Norton 1996a). This feature amplifies the understanding of how strategic objectives drive performance, leading to a more contextually justifiable selection of measures and initiatives. Furthermore, the introduction of the 'destination statement' in the third-generation BSC provides a clearer picture of what strategic success resembles (Lawrie and Cobbold 2004). This clear vision empowers managers to intervene proactively to correct any divergence or enhance current undertakings as opportunities emerge.

From a practical viewpoint, critics lamented the commercial focus (customers, shareholders) of the BSC, rendering the strategic performance measurement and management tool less relevant for public and non-profit organizations, where elements such as non-commercial stakeholders (e.g., society) and the distinctive nature of collaboration (as opposed to competition) are regarded as important considerations for strategic performance measurement and management (Kong 2010). This has led to a plethora of endeavors to adapt or contextualize the BSC, for example, the public sector scorecard (Moulin 2017) and the results-based management method (Lawrie et al. 2005), which take into account the interests of a wider and more diverse group of stakeholders (e.g., local communities, supply chain partners), going beyond customers and shareholders, in line with stakeholder theory (Mahajan et al. 2023). Besides the extrapolation of the BSC beyond commercial settings, another noteworthy practical advancement is automation through the use of technology (software) to support managers in developing, updating, and reporting the BSC (Marr and Neely 2003), thereby showing that the complexity of the BSC, especially when they are extrapolated across business units and departments (i.e., multiple BSCs), can be pragmatically managed with ease by leveraging the advances and benefits of technology.

With the advancement of the BSC, several noteworthy trends are observed. At its peak, the BSC was reportedly used by 53% of companies in the late 2000s (Rigby and Bilodeau 2009), though its use has plummeted to 29% in the late 2010s (Rigby and Bilodeau 2018) based on the responses of more than 1,000 managers of global companies surveyed by Bain and Company. However, in the early 2020s, 2GC (2021) reported that the usage of BSC has increased at the executive level from 44% in 2019 to 88% in 2020, and that 80% of the private and public sector organizations surveyed across 21 countries have found the BSC as or more useful than before the COVID-19 pandemic, and thus, reaffirming the value of the BSC as a strategic performance measurement and management tool that supports organizations in managing and responding to strategic change.

Building upon the existing body of BSC research, which has broadened and evolved over time, this study extends beyond previous reviews. Hoque (2014) conducted a 20-years systematic literature review (SLR) of 114 BSC articles from 25 accounting and 67 business and management journals, which highlighted the various topics, settings, theories, methodologies, and analytical techniques within the field. However, our study does not restrict its scope to solely accounting and management, instead encompassing all aspects of BSC. Furthermore, in contrast to prior work, our study adopts an SLR approach using a bibliometric analysis with a temporal perspective. This approach presents an exhaustive overview of the field, revealing

the intellectual structure of the field alongside its evolution over time (Carlsson et al. 2017; Xu et al. 2018). In this regard, this study seeks not only to extend Hoque (2014)'s work but also to uncover new insights into the progress and diversification of BSC research across various timelines. Discerning the thematic structure of BSC is crucial for both academic and practical applications, assisting in the understanding of BSC trends and its application in contemporary performance measurement practices amidst complex stakeholder interactions. In addition, this study will also suggest potential avenues for future research, contributing to the advancement of the BSC field.

In the decade since the last review, there has been a marked opportunity for a timely update on the field's progression (Lim et al. 2022a, b). Tawse and Tabesh (2022) recently conducted a 30-year review of 11 BSC articles that contained statistical data, which allowed them to calculate the effect size of the relationships between BSC usage and firm performance. This offered corroborative evidence indicating the positive contributions of BSC to organizational outcomes. However, as the current study demonstrates, the body of BSC research is vast (> 1000 articles), suggesting previous reviews (Hoque 2014; Tawse and Tabesh 2022) have offered limited coverage (Table 1). Furthermore, the performance of BSC research in terms of publication and citation has yet to be rigorously analyzed, a critical step in establishing the field's productivity and impact (Donthu et al. 2021). Also, the scientific knowledge of BSC research has yet to be holistically mapped, which is crucial for establishing the intellectual structure of the major themes and topics in the field (Mukherjee et al. 2022). In employing a bibliometric analysis, this study offers an efficient, bias-minimized approach capable of objectively analyzing a vast corpus of articles. As an established review method, bibliometric analysis has proven itself a potent tool for effectively handling, reviewing, and examining substantial scientific data (Donthu et al. 2021). Using this approach, our study offers a highly comprehensive and objective overview of BSC research, focusing on the field's productivity, impact, and thematic scope. In this regard, our study serves as an essential reference point, providing an updated, comprehensive overview of BSC research's current state and future prospects. Thus, our study facilitates the understanding of current trends, developments, and future directions, and should be useful for academics, practitioners, and students interested in the evolution and impact of BSC.

## 2 Methodology

This study adopts an SLR approach to review the extant literature on the BSC. An SLR involves the systematic search (i.e., corpus curation) and evaluation (i.e., corpus analysis) of relevant studies in the body of knowledge (Bouncken et al. 2015; Sauer and Seuring 2023; Tranfield et al. 2003; Vlačić et al. 2021). The evaluation part of an SLR could be performed in numerous ways, most notably through a bibliometric analysis (automated) or a content analysis (manual) (Kraus et al. 2022). Given the large corpus of studies on the BSC, it would be more pragmatic and sensible to engage in the former rather than the latter (Donthu et al. 2021).

**Table 1** Comparison of existing reviews and this review of BSC research

| Criteria | Hoque (2014) | Tawse and Tabesh (2022) | The present review |
|---|---|---|---|
| Focus | BSC research in "accounting" and "business and management" | BSC research without any specific disciplinary limitation, but with the criterion of statistical information required to calculate the effect size between the BSC and firm performance relationship | BSC research without any specific disciplinary limitation |
| Coverage | 20 years: 181 articles published in selected journals between 1992 and 2011 | 30 years: 11 articles published between 1992 and 2022 that can be retrieved from electronic databases (e.g., Business Source Complete, Science Direct, and Google Scholar) | 31 ½ years: 1,294 articles published in journals indexed in Scopus between 1992 and 2023 |
| Review method | Content analysis | Meta-analysis | Bibliometric analysis |
| Key findings | Topics<br>Research settings<br>Theories<br>Research methods<br>Data analysis techniques | The relationship between BSC and firm performance is positively and significantly related | Major publication and citation trends<br>Major research constituents<br>Collaboration network<br>Intellectual structure of major themes and topics on the BSC |

### 2.1 Corpus curation

Differing from a traditional review, an SLR follows a structured process that can be transparently disclosed and replicated, thereby mitigating review ambiguity and bias (Lim et al. 2022a, b; Rowley and Slack 2004; Sauer and Seuring 2023; Tranfield et al. 2003). Three databases are commonly used in review studies: Google Scholar, Scopus, and Web of Science (WoS) (Kraus et al. 2022). However, Google Scholar is not utilized for bibliometric reviews as it does not offer essential bibliometric data for download (Donthu et al. 2021). Between Scopus and WoS, Scopus is the larger database, offering a wider coverage of peer-reviewed literature (Norris and Oppenheim 2007; Sharma et al. 2023). Roughly 95% of the journals indexed in WoS are also indexed in Scopus, while only about half of the articles indexed in Scopus are also indexed in Web of Science (Mongeon and Paul-Hus 2016). This demonstrates the broader reach of Scopus as compared to WoS. Thus, to curate a corpus of relevant articles for review, this study carried out a Scopus (*search engine*) search for "English" (language) "article" and "review" documents (*document type*) on "balanced scorecard" (*search keyword*) in the "article title, abstract, and keywords" (*search field*) up to July 2023 (*search period*). This search criteria can be justified on the basis that (i) Scopus is a scientific database that indexes one of the largest collection of articles for sources that have passed stringent quality standards (and more than the Web of Science), (ii) English is the only language that all authors of this article are most proficient in, (iii) article and review documents typically undergo full-fledge peer review unlike other document types such as editorial and notes, (iv) the use of a single keyword is sufficient when that keyword is central and plays a non-negotiable part to the study, (v) keywords that appear in the article title, abstract, and keywords sections of a document are likely to be central to that document, and (vi) the start of the search period was left undefined but the end of the search period was naturally limited to the time of search to capture the maximum number of relevant documents available at the time of study. The search based on these criteria and justifications, which are in line with recent reviews (e.g., Lim et al. 2021, 2022a, b) and review guides (Kraus et al. 2022), returned a total of 2,957 documents.

Given that potential concerns of predatory publishing have been raised by recent scholars such as Marina and Sterligov (2021) despite Scopus's stringent indexing criteria and corrective actions to remove predatory sources from their list, this study took additional precaution by subjecting the 3,344 documents to quality filtering, ensuring that only documents published in high-quality and legitimate outlets are included for review. To do so, the research incorporated documents that were assessed by at least two of the following sources: the Chartered Association of Business Schools Academic Journal Guide (ABS), the Australian Business Deans Council Journal Quality List (ABDC), or the Web of Science Impact Factor (WoS IF). Following this form of quality filtering, the final set of documents consists of 1,294 documents, which we reviewed using the methods described in the next section.

### 2.2 Corpus analysis

There are many methods to perform an SLR (e.g., content analysis, bibliometric analysis, meta-analysis) (Lim et al. 2022a, b). In this study, the bibliometric approach was adopted to review extant BSC research, as it leverages technological automation, enabling analysis of a large corpus of documents while maintaining objectivity through quantitative and statistical methods (Donthu et al. 2021). Bibliometrics was a term coined by Pritchard (1969) to refer to the bibliographic aspects of scientific documents (e.g., author information, article information) that can be analyzed using various quantitative methods or statistical tools to construct an objective understanding (Zupic and Čater 2015) and provide meaningful inferences about various facets of the literature (Carlsson et al. 2017). By convention, an SLR powered by bibliometric analysis involves the implementation of performance analysis and science mapping (Donthu et al. 2021). In particular, the productivity and impact of the literature is assessed based on publications and citations as part of the performance analysis, whereas the major author groups, themes, and topics in the literature are discovered and mapped as part of science mapping, thereby providing an objective assessment of the field's performance as well as an objective understanding of the nomological network of knowledge in that field (Mukherjee et al. 2022).

In this study, a performance analysis is carried out to ascertain (i) the publication (productivity) trend of BSC research, (ii) the top journals (productively) contributing to BSC research, and (iii) the most influential (global citation) and prestigious (local citations by highly cited articles) BSC publications. In addition, a science mapping is conducted to establish (i) the major author groups and country collaborations (using co-authorship analysis) and (ii) the major themes and topics (using a co-occurrence analysis of keywords) of BSC research. The performance analysis is executed via the Microsoft Excel software while the science mapping (co-authorship analysis, co-occurrence analysis of keywords) is implemented using the Gephi software (Bastian et al. 2009). The use of multiple software, where appropriate (useful), is also aligned with Donthu et al. (2021). Figure 1 presents a summary of the review procedure of corpus curation and corpus analysis.

## 3 Performance analysis of BSC research

### 3.1 Publication trend of BSC research

Since its inception in 1992 (Kaplan and Norton 1992), numerous scholars have contributed to BSC research till 2023. In particular, 1294 publications on the BSC have appeared in journals rated or ranked in at least two out of the ABS, the ABDC, or the WoS IF (Fig. 2).

The productivity (publication) of BSC research has generally been on an upward trajectory over two decades (1992–2012) (Fig. 2), which may be attributed to the pipeline of scholarly contributions by Kaplan and Norton during this period. This pipeline includes demonstrating the application of the BSC (Kaplan and Norton 1993),

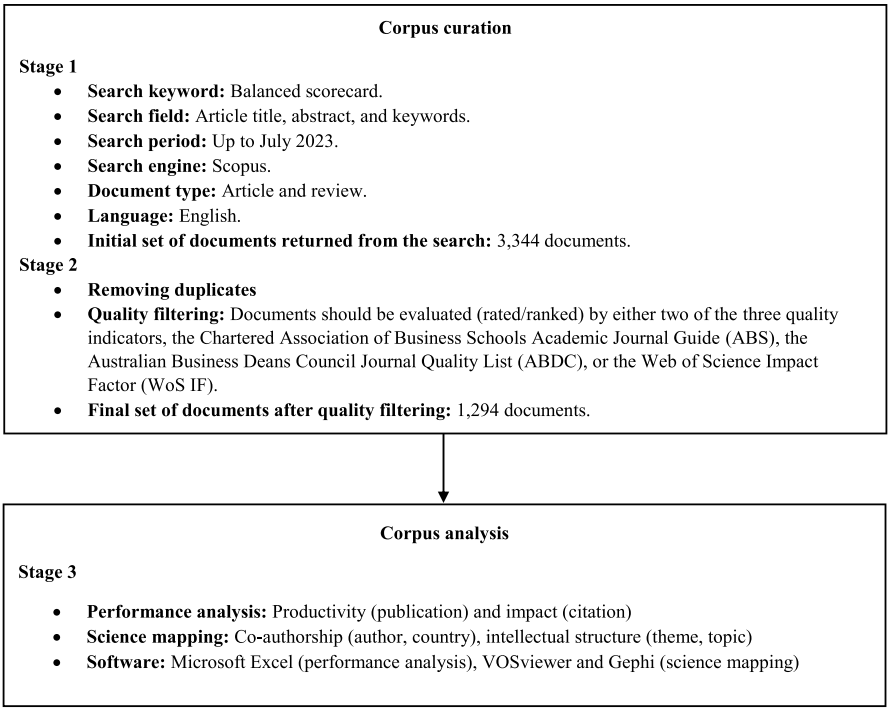


**Fig. 1** Review procedure. *Note* A comprehensive search was conducted using Scopus, a widely recognized academic database, to retrieve relevant literature on the topic of "balanced scorecard". The Scopus search yielded a total of 1,294 documents, providing a robust dataset for analysis. This approach was chosen due to its extensive coverage and reputation for indexing a diverse range of scholarly sources. It is worth noting that an alternative search on the Web of Science database using the same keyword initially retrieved 1,824 documents. However, after applying filters for English language, document type (articles and reviews), and considering quality criteria such as the Chartered Association of Business Schools Academic Journal Guide (ABS), the Australian Business Deans Council Journal Quality List (ABDC), or the Web of Science Impact Factor (WoS IF), the results were further refined to a total of 765 documents. Given the larger number of documents retrieved from Scopus, it was deemed more suitable for this study's purposes. In this regard, using Scopus as the primary database ensures a comprehensive and diverse selection of scholarly articles, enhancing the reliability and validity of the findings

the linkage of the BSC to strategy (Kaplan and Norton 1996a), the utility of the BSC as a strategic management system (Kaplan and Norton 1996b), the translation of strategy into action using the BSC (Kaplan and Norton 1996c), the utility of strategy maps in the BSC for converting intangible assets into tangible outcomes (Kaplan and Norton 2004), the techniques for mastering the BSC (Kaplan and Norton 2008a), the execution premium of competitive advantage for linking strategy to operations using the BSC (Kaplan and Norton 2008b), and the management of alliances with the BSC (Kaplan et al. 2010).

However, the productivity of research on the BSC has shown a decline and downward trend since its inception in 1992, particularly in the third decade (2012–2023) (Fig. 2). While this decline could be attributed to the retirement of the founders of

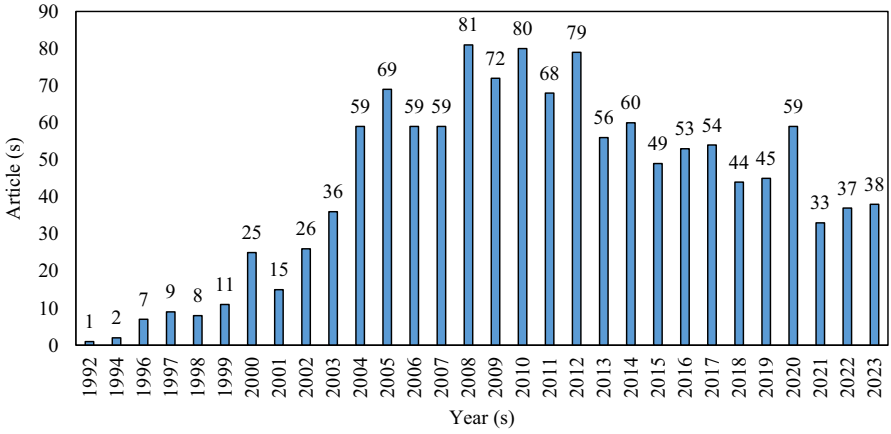


**Fig. 2** Publication trend of BSC research

the BSC, it is evident that the current situation underscores the importance of additional scientific research to progress the field. Interestingly, 2023 marks a resurgence in BSC research, likely driven by the global emphasis on sustainable development goals in the wake of COVID-19 (Lim 2022a). Researchers are now recognizing the urgency to evolve the BSC framework by integrating contemporary business trends like ESG metrics and addressing obstacles to its effective deployment (Lim, Ciasullo et al. 2023). The proposed future research directions outlined in this study aim to assist scholars in bolstering BSC research in the coming years. Therefore, it is evident that novel ideas are required to rejuvenate the BSC and propel its research towards a positive growth trajectory.

### 3.2 Top journals contributing to BSC research

The 1294 publications on the BSC over three decades[1] (1992–2023) have appeared in 340 journals rated or ranked in either the ABS, the ABDC, or the WoS IF (Table 2). The top three most productive journals for BSC research are *International Journal of Productivity and Performance Management* (TP: 74), *Measuring Business Excellence* (TP: 52), and *Expert Systems with Applications* (TP: 31), all of which represent outlets with a focus on achieving business excellence through strategic performance measurement and management. Nonetheless, the relevance of the BSC is also witnessed across numerous application or specialty areas, including accounting (e.g., *Managerial Auditing Journal*), healthcare (e.g., *International Journal of Health Care Quality Assurance*), information systems (e.g., *International Journal of Business Information Systems*), knowledge

[1] The phrase "over three decades" is used as it generally refers to a time span that is more than 30 years. If the period were exactly 30 years, one would typically say "three decades". Therefore, "over three decades" implies a duration extending beyond the 30-year mark.

**Table 2** Top journals contributing to BSC research

| Journal | TP | ABS | ABDC | WoS IF |
|---|---|---|---|---|
| *International Journal of Productivity and Performance Management* | 74 | 1 | B | – |
| *Measuring Business Excellence* | 52 | 1 | B | – |
| *Expert Systems with Applications* | 31 | 1 | C | 5.452 |
| *Journal of Accounting and Organizational Change* | 28 | 2 | B | – |
| *Total Quality Management and Business Excellence* | 30 | 2 | C | 2.922 |
| *Management Accounting Research* | 24 | 3 | A | 3.054 |
| *Management Decision* | 22 | 2 | B | 2.723 |
| *Journal of Cleaner Production* | 21 | 2 | A | 7.246 |
| *Managerial Auditing Journal* | 18 | 2 | A | 1.87 |
| *Production Planning and Control* | 15 | 3 | A | 3.605 |
| *Journal of Intellectual Capital* | 17 | 2 | B | 4.805 |
| *International Journal of Quality and Reliability Management* | 14 | 2 | B | – |
| *Advances in Management Accounting* | 15 | 2 | A | – |
| *International Journal of Production Economics* | 13 | 3 | A | 5.134 |
| *Industrial Management and Data Systems* | 14 | 2 | A | 3.329 |
| *International Journal of Business Information Systems* | 13 | 1 | C | – |
| *International Journal of Health Care Quality Assurance* | 14 | 1 | C | – |
| *Facilities* | 13 | 1 | B | – |
| *Accounting Organizations and Society* | 12 | 4 | A | 3.958 |
| *Journal of Knowledge Management* | 12 | 2 | A | – |
| *European Journal of Operational Research* | 11 | 4 | A | 4.213 |
| *Service Industries Journal* | 11 | 2 | B | – |
| *European Management Journal* | 11 | 2 | B | 2.369 |
| *Business Strategy and the Environment* | 10 | 3 | A | 10.801 |
| *Journal of Management Accounting Research* | 10 | 2 | A | – |

All journals with more than 10 publications on the BSC are listed in this table

*TP* Total publications, *ABS* Chartered Association of Business Schools Academic Journal Guide, *ABDC* Australian Business Deans Council Journal Quality List, *WoS IF* Web of Science Impact Factor

management (e.g., *Journal of Knowledge Management*), and sustainability (e.g., *Journal of Cleaner Production*). This shows that the BSC has utility for advancing both mainstream strategic management as well as application or specialty areas across contexts. However, existing research on the BSC primarily appears in journals that predominantly focus on accounting and operations research, emphasizing the limited integration of the BSC in other management domains such as marketing and innovation. This highlights the strain and underscores the importance of incorporating the BSC in diverse management fields. Thus, there is a clear opportunity for scholars to explore the application of the BSC in different areas of management and contribute to the development of the next-generation frontiers of research in this field. Additionally, publishing in premier journals serves as a signal that should motivate scholars to invest their valuable time and

effort in exploring new avenues that can enhance both the theory and practice of the BSC.

### 3.3 Most influential BSC research

The research on the BSC that holds the most influence is determined through the examination of global citations, which includes citations received from both BSC and non-BSC research (Ding and Cronin 2011). Identifying influential articles is crucial for gaining insight into the intellectual dynamics of the research field (Donthu et al. 2021). The findings of this analysis can be particularly useful for scholars in the BSC field, as it enables them to navigate and prioritize the most important works (Table 3). The most influential BSC research is Kaplan and Norton (1992) (TC: 7700), which introduces the BSC as a strategic performance measurement and management tool. This observation is unsurprising given the seminal status of this publication in establishing the BSC. The other two publications listed in the top three most influential BSC research are Jensen (2002) (TC: 1170), which criticizes the BSC for not providing managers with a score to indicate how they have performed, and Otley (1999) (TC: 939), which showcases the complementary value of the BSC with budgeting and economic value added in a trifecta system of organizational control. Other works by Kaplan and Norton (1996a, b, c, 2000, 2004) also appear in this list alongside other prominent scholars such as Andy Neely (e.g., Neely 2005; Neely et al. 2000a, b) and Christopher D. Ittner (e.g., Ittner et al. 2003a, b; Ittner et al. 2003a, b) who have contributed both conceptual and empirical works on the BSC. This shows that the BSC has its fair share of advocates and critics, which bodes well for academic freedom, scholarly debate, and knowledge advancement. More importantly, prospective authors should be cognizant of these high-impact BSC research and use them, where appropriate, to build a strong theoretical foundation and positioning for advancing the BSC in their future research.

### 3.4 Most prestigious BSC research

It is essential not only to examine influential articles but also to explore prestigious articles in order to understand the intellectual milestones of the field (Kumar et al. 2022a, b). The most prestigious BSC research is often determined using PageRank (Donthu et al. 2021). Unlike citations, which basically measures the number of times a document is cited, PageRank calculates the prominence of a document within a collection of documents by computing a score based on the number of citations a paper receives from other highly cited papers in the field (Brin and Page 1998). When applied to this study, PageRank accounts for the local citations received by a BSC research paper from highly-cited BSC research papers (Table 4). In this regard, PageRank serves as an indicator of both popularity and prestige (Donthu et al. 2021). The most prestigious BSC research are Bartlett et al. (2014) (PageRank: 0.0043), which sheds light on how the inclusion of a strategy implementation timeline and varying levels of accountability affect the emphasis that evaluators, in roles of either supervisors or subordinates, place on leading non-financial versus lagging financial

**Table 3** Most influential BSC research

| Author(s) and year | Title | Journal | TC |
|---|---|---|---|
| Kaplan and Norton (1992) | The balanced scorecard – Measures that drive performance | *Harvard Business Review* | 7700 |
| Jensen (2002) | Value maximization, stakeholder theory, and the corporate objective function | *Business Ethics Quarterly* | 1170 |
| Otley (1999) | Performance management: A framework for management control systems research | *Management Accounting Research* | 939 |
| Kaplan and Norton (1996a, b, c) | Linking the balanced scorecard to strategy | *California Management Review* | 735 |
| Figge et al. (2002) | The sustainability balanced scorecard – Linking sustainability management to business strategy | *Business Strategy and the Environment* | 716 |
| Roos and Roos (1997) | Measuring your company's intellectual performance | *Long Range Planning* | 699 |
| Kaplan and Norton (2000) | Having trouble with your strategy? Then map it | *Harvard Business Review* | 688 |
| Norreklit (2000) | The balance on the balanced scorecard – A critical analysis of some of its assumptions | *Management Accounting Research* | 678 |
| Ittner et al. (2003a, b) | Performance implications of strategic performance measurement in financial services firms | *Accounting Organizations and Society* | 599 |
| Bontis et al. (1999) | The knowledge toolbox: A review of the tools available to measure and manage intangible resources | *European Management Journal* | 552 |
| Neely et al. (2000a, b) | Performance measurement system design: Developing and testing a process-based approach | *International Journal of Operations and Production Management* | 546 |
| Hubbard (2009) | Measuring organizational performance: Beyond the triple bottom line | *Business Strategy and the Environment* | 533 |
| Kaplan and Norton (2004) | Measuring the strategic readiness of intangible assets | *Harvard Business Review* | 531 |
| Bhagwat and Sharma (2007) | Performance measurement of supply chain management: A balanced scorecard approach | *Computers and Industrial Engineering* | 509 |
| Neely (2005) | The evolution of performance measurement research: Developments in the last decade and a research agenda for the next | *International Journal of Operations and Production Management* | 508 |
| Chenhall (2005) | Integrative strategic performance measurement systems, strategic alignment of manufacturing, learning and strategic outcomes: An exploratory study | *Accounting Organizations and Society* | 498 |
| Ittner et al. (2003a, b) | Subjectivity and the weighting of performance measures: Evidence from a balanced scorecard | *Accounting Review* | 482 |
| Lee et al. (2008) | A fuzzy AHP and BSC approach for evaluating performance of IT department in the manufacturing industry in Taiwan | *Expert Systems with Applications* | 477 |

**Table 3** (continued)

| Author(s) and year | Title | Journal | TC |
|---|---|---|---|
| Lipe and Salterio (2000) | The balanced scorecard: Judgmental effects of common and unique performance measures | *Accounting Review* | 450 |
| Franco-Santos et al. (2012) | Contemporary performance measurement systems: A review of their consequences and a framework for research | *Management Accounting Research* | 422 |
| Jensen (2002) | Value maximisation, stakeholder theory, and the corporate objective function | *European Financial Management* | 422 |
| Ravi et al. (2005) | Analyzing alternatives in reverse logistics for end-of-life computers: ANP and balanced scorecard approach | *Computers and Industrial Engineering* | 384 |
| Davis and Albright (2004) | An investigation of the effect of balanced scorecard implementation of financial performance | *Management Accounting Research* | 360 |
| Perrini and Tencati (2006) | Sustainability and stakeholder management: The need for new corporate performance evaluation and reporting systems | *Business Strategy and the Environment* | 351 |

We observed that though Michael C. Jensen has published three articles with the same title "Value maximi(s/z)ation, stakeholder theory, and the corporate objective function" in *Business Ethics Quarterly* (2002), *European Financial Management* (2001), and *Journal of Applied Corporate Finance* (2010), the concentration and content in each article is relatively different from each other, two of which appears in the list of the top 20 most influential BSC research

*TC* Total citations (global citations)

**Table 4** Most prestigious BSC research

| Article | Title | Journal | PageRank |
|---|---|---|---|
| Bartlett et al. (2014) | Accountability and role effects in balanced scorecard performance evaluations when strategy timeline is specified | *European Accounting Review* | 0.0043 |
| Malagueño et al. (2018) | Balanced scorecard in SMEs: Effects on innovation and financial performance | *Small Business Economics* | 0.0043 |
| Phadtare (2010) | Developing balanced scorecard: Case of three construction firms of small size | *Journal of Asia Pacific Business* | 0.0041 |
| Huang et al. (2006) | Balancing performance measures for information security management: A balanced scorecard framework | *Industrial Management and Data Systems* | 0.0035 |
| Cheng et al. (2018) | The interplay between strategic risk profiles and presentation format on managers' strategic judgments using the balanced scorecard | *Accounting Organizations and Society* | 0.0035 |
| Vieira et al. (2017) | Aligning strategy and performance management systems: The case of the wind-farm industry | *Organization and Environment* | 0.0031 |
| Oyewo et al. (2021) | Is the use of integrated performance measurement system by banks really "integrated"? A structural equation modeling approach | *Journal of East West Business* | 0.0029 |
| Granero et al. (2017) | Influence of contingency factors in the development of the BSC and its association with better performance. The case of Spanish companies | *Revista de Contabilidad Spanish Accounting Review* | 0.0028 |
| Salterio (2012) | Balancing the scorecard through academic accounting research: Opportunity lost? | *Journal of Accounting and Organizational Change* | 0.0022 |
| Chopra and Gupta (2020) | Linking knowledge management practices to organizational performance using the balanced scorecard approach | *Kybernetes* | 0.0021 |
| Chang et al. (2013) | Using the balanced scorecard on supply chain integration performance-a case study of service businesses | *Service Business* | 0.0017 |

**Table 4** (continued)

| Article | Title | Journal | PageRank |
|---|---|---|---|
| Pour et al. (2017) | Developing a new framework for evaluating e-learning systems: Integrating BSC and FAHP | *Kybernetes* | 0.0017 |
| Zimmermann and Seuring (2009) | Two case studies on developing, implementing and evaluating a balanced scorecard in distribution channel dyads | *International Journal of Logistics Research and Applications* | 0.0017 |
| Amos et al. (2020) | Modelling the performance of waste management services in Ghana's public hospitals: A facilities management perspective | *Facilities* | 0.0017 |
| Qu and Cooper (2011) | The role of inscriptions in producing a balanced scorecard | *Accounting Organizations and Society* | 0.0016 |
| Aranda and Arellano (2010) | Consensus and link structure in strategic performance measurement systems: A field study | *Journal of Management Accounting Research* | 0.0016 |
| Merchant (2006) | Measuring general managers' performances: Market, accounting and combination-of-measures systems | *Accounting Auditing and Accountability Journal* | 0.0016 |
| Chenhall (2008) | Accounting for the horizontal organization: A review essay | *Accounting Organizations and Society* | 0.0015 |
| De Geuser et al. (2009) | Does the balanced scorecard add value? Empirical evidence on its effect on performance | *European Accounting Review* | 0.0015 |
| Cardinaels and van Veen-Dirks (2010) | Financial versus non-financial information: The impact of information organization and presentation in a balanced scorecard | *Accounting Organizations and Society* | 0.0015 |

measures in a BSC, and Malagueño et al. (2018) (PageRank: 0.0043), which reveals that the use of the BSC positively impacts financial performance and exploitative innovation, particularly in more established firms. This indicates that BSC research that may not necessarily be highly cited due to various reasons (e.g., article age, content niche or specialty) can still yield a significant impact on the field by influencing the foundational knowledge relied upon by highly-cited BSC research. In that sense, prospective authors are highly encouraged to be well verse with not only the most influential BSC research but also the most prestigious BSC research as they are very likely to be both useful and relevant for establishing a strong theoretical foundation for new BSC research.

## 4 Science mapping of BSC research

### 4.1 Co-authorship (collaboration) network of BSC research

The most prolific authors for BSC research are Robert S. Kaplan (TP: 16), David P. Norton (TP: 13), Wayne G. Bremser (TP: 11), and Mike Bourne (TP: 9). To provide a deeper dive on the main author groups for BSC research, a co-authorship analysis was conducted.[2] According to Acedo et al. (2006), co-authorship in a scientific domain signifies official partnerships. The collaborative network of author interactions was visualized using the Gephi software (Bastian et al. 2009). Initially, a.net file was created from a.csv file containing bibliographic data from 1294 documents. The resulting file was then processed in the Gephi software, where the Louvian algorithm, which identifies communities within a large network by optimizing the modularity index (Blondel et al. 2008), was employed to establish co-authorship networks and groups. A summary of the most collaborative author groups, their geographical affiliations, and research focuses is presented in Table 5. The table also highlights the three main academic outlets where these author groups frequently publish. The analysis revealed eight major author groups specializing in BSC research. Readers can utilize this information to identify experts for consultation and collaboration based on geographical location and/or research focus areas related to the BSC.

*Author Group 1*, one of the joint largest author groups, is led by José Baltazar Salgueirinho Osório de Andrade Guerra, with a total link strength of 23. This group includes other notable authors such as Samara da Silva Neiva, Wellyngton Silva de Amorim, André Borchardt Deggau, and Samuel Borges Barbosa. While these authors are based in Brazil and the United Kingdom, their research extends beyond their geographical affiliations. The research of this group, which is most recent (APY: 2020.00–2021.00), focuses on the intersection of the BSC with food stability, environmental education, sustainable development goals, and strategic management. Their work has been published in esteemed outlets,

[2] On the grounds of pragmatism, the co-authorship analysis was limited to (i) authors who have published a minimum of three studies on the BSC, and (ii) authors who have collaborated with more than two authors for BSC research.

**Table 5** Prominent author groups in BSC research

| Author group | Author | Total link strength | Average publication year | Geographical affiliation | Focus(es) | Exemplars of published journals |
|---|---|---|---|---|---|---|
| 1 | De Andrade Guerra J.B.S.O | 23 | 2020.25 | Brazil<br>United Kingdom | Food stability<br>Environmental education<br>Sustainable development goals<br>Strategic management | *Journal of Cleaner Production*<br>*Stochastic Environmental Research and Risk Assessment*<br>*Sustainable Development* |
| | Da Silva Neiva S | 22 | 2021.00 | | | |
| | De Amorim W.S | 20 | 2021.00 | | | |
| | Deggau A.B | 20 | 2021.00 | | | |
| | Barbosa S.B | 20 | 2020.00 | | | |
| 2 | Bremser W.G | 12 | 2007.30 | Canada<br>United States | Collaborative BSC as an open reporting system<br>Performance measurement<br>Research and development | *Accounting Research Journal*<br>*Advances in Management Accounting*<br>*Journal of Accounting Education* |
| | Herath H.S.B | 9 | 2013.33 | | | |
| | Birnberg J.G | 8 | 2013.25 | | | |
| | Mertins L | 2 | 2016.00 | | | |
| 3 | Quezada L.E | 13 | 2016.88 | Chile<br>Colombia | Business strategy<br>Strategy map | *Computers and Industrial Engineering*<br>*Management Decision*<br>*International Journal of Production Economics* |
| | Palominos P.I | 11 | 2017 | | | |
| | Oddershede A.M | 8 | 2020 | | | |
| | López-Ospina H.A | 7 | 2018 | | | |

**Table 5** (continued)

| Author group | Author | Total link strength | Average publication year | Geographical affiliation | Focus(es) | Exemplars of published journals |
|---|---|---|---|---|---|---|
| 4 | Neely A | 17 | 2003.25 | United Kingdom | Automating BSC<br>Performance measurement system design | *International Journal of Operations and Production Management*<br>*Management Decision*<br>*Measuring Business Excellence* |
| | Bourne M | 14 | 2005.00 | | | |
| | Marr B | 8 | 2003.80 | | | |
| 5 | Sands J | 7 | 2011.20 | Australia | Continuous improvement systems<br>Environmental performance<br>Goal setting<br>Performance reporting<br>Reporting systems | *International Journal of Accounting Auditing and Performance Evaluation*<br>*Journal of Applied Accounting Research*<br>*Journal of General Management* |
| | Iselin E.R | 6 | 2009.25 | | | |
| | Mia L | 6 | 2009.25 | | | |
| 6 | Kumar V | 7 | 2013.50 | Canada<br>India<br>Sweden | E-business success<br>Maintenance performance management | *Industry and Higher Education*<br>*International Journal of Productivity and Performance Management* |
| | Galar D | 6 | 2008.75 | | | |
| | Parida A | 6 | 2014.67 | | | |
| | Stenström C | 6 | | | | |

**Table 5** (continued)

| Author group | Author | Total link strength | Average publication year | Geographical affiliation | Focus(es) | Exemplars of published journals |
|---|---|---|---|---|---|---|
| 7 | Anjomshoae A | 6 | 2019.00 | Malaysia | Humanitarian supply chains<br>Humanitarian relief organizations' performance management | *International Journal of Managerial and Financial Accounting*<br>*International Journal of Productivity and Performance Management*<br>*Journal of Humanitarian Logistics and Supply Chain Management* |
| | Hassan A | 6 | 2019.00 | | | |
| | Wong K.Y | 6 | 2019.00 | | | |
| 8 | Lee A.H.I | 6 | 2008.00 | China<br>Taiwan | Knowledge management<br>New product development<br>Process development management | *Computers in Industry*<br>*International Journal of Production Research*<br>*Technological Forecasting and Social Change* |
| | Chen H.H | 6 | 2008.00 | | | |
| | Tong Y | 6 | 2008.00 | | | |
| 9 | Lin C.-T | 6 | 2010.00 | Taiwan | Financial service sector performance measurement<br>Wealth management banks | *European Journal of Operational Research*<br>*Information and Management*<br>*Total Quality Management and Business Excellence* |
| | Tsai P.-H | 6 | 2010.00 | | | |
| | Wu C.-R | 6 | 2010.00 | | | |

including the *Journal of Cleaner Production*, *Sustainable Development*, and the *Stochastic Environmental Research and Risk Assessment*. Notable works by this author group include publications by Da Silva Neiva et al. (2021) and Ribeiro et al. (2021).

*Author Group 2*, one of the joint largest author groups, is led by Wayne G. Bremser, whose total link strength is 12. Other notable authors in this group include Hemantha S.B. Herath, Jacob G. Birnberg, and Lasse Mertins. These authors are affiliated with institutions in Canada and the United States. The research conducted by this group, which falls within a moderately recent time frame (APY: 2007.00–2020.00), primarily focuses on the BSC in conjunction with open reporting systems (or collaborative BSC), performance measurement, and research and development. Works contributed by this group include Herath et al. (2014, 2019) and Bremser and White (2000). Their research has appeared in international journals like *Accounting Research Journal*, *Advances in Management Accounting*, and the *Journal of Accounting Education*.

*Author Group 3* is headed by Luis E. Quezada with a total link strength of 13, followed by Pedro I. Palominos. This group, which is based in Chile and Colombia, focuses on business strategy and strategy maps. Also, the group shows an inclination towards analytic network process (ANP) and decision-making trial and evaluation laboratory (DEMATEL) methodologies (Quezada et al. 2014, 2022). The research conducted by this group are published in premier outlets like *International Journal of Production Economics* and *Management Decision.*

*Author Group 4*, led by Andy Neely with a total link strength of 17, comprises notable authors such as Mike Bourne and Bernard Marr. These authors are based in the United Kingdom. The group's research, conducted around 2003.25 and 2005.00, primarily focuses on the automation of the BSC and the design of performance measurement and management systems that utilize the BSC (Neely et al. 2000a, b; Marr et al. 2004).

*Author Group 5*, led by John Sands with a total link strength of 7, consists of notable authors such as Errol R. Iselin and Lokman Mia, who are located in Australia. This group's research, conducted around 2009.25 and 2011.20, primarily focuses on the BSC in conjunction with continuous improvement systems, environmental performance, goal setting, performance reporting, and reporting systems. Noteworthy works by this trio include Iselin et al. (2010) and Iselin et al. (2008), which explore the multi-perspectives of performance measurement, systems, and reporting.

*Author Group 6*, led by V. Kumar with a total link strength of 7, features other notable authors such as Diego Galar, Aditya Parida, and Christer Stenström, located in Canada, India, and Sweden. Their research, conducted around 2008.75 and 2014.67, mainly encompasses conceptual and review studies on the BSC in connection with e-business success and maintenance performance management. This group has contributed primarily to review and conceptual works such as Kumar et al. (2013) and Frederico (2021).

*Author Group 7*, comprising Ali Anjomshoae, Adnan Hassan, and Kuan Yew Wong, has a total link strength of six and is based in Malaysia. Their research, published around 2019, primarily revolves around the BSC in conjunction with the humanitarian context. Their main areas of expertise lie in humanitarian

relief organizations' performance management and humanitarian supply chains (Anjomshoae et al. 2017, 2019).

*Author Group 8*, led by Amy H. I. Lee with a total link strength of 6, includes notable authors like Hsing Hung Chen and Yunhuan Tong. These authors are located in China and Taiwan. The group's research, conducted around 2008.00, predominantly explores the integration of the BSC with knowledge management, new product development, and process development management (Chang et al. 2013). The scholars also demonstrate expertise in employing multi-criteria decision-making techniques such as fuzzy analytic hierarchy process and analytical network process (Lee et al. 2008).

*Author Group 9* consists of Chin-Tsai Lin, Pei-Hsuan Tsai, and Cheng-Ru Wu, each with a total link strength of six. These authors are based in Taiwan. The group's research, conducted around 2010.00, primarily investigates the application of the BSC in the financial services sector, specifically in the context of performance management and wealth management banks. Their works address various issues related to wealth management banks, including business performance, financial services, and performance measurement models utilizing the BSC approach (Wu et al. 2010).

### 4.2 Country (collaboration) network of BSC research

The most prolific countries for BSC research are the United States (TP: 198), the United Kingdom (TP: 174), Australia (TP: 102), Taiwan (TP: 73), Italy (TP: 63), Canada (TP: 54), Spain (TP: 53) and Iran (TP: 50). The country (collaboration) network for BSC research is depicted in Fig. 3 using a network analysis. The figure indicates that the United Kingdom is the most prominent lynchpin with the highest collaborations, followed by the United States. The country (collaboration) network involving these two countries are fairly large and wide, unlike countries such as Chile, Colombia, and Switzerland, which have a fairly small and narrow network. Other countries that have no or fewer collaborative links with other countries indicate opportunities for cross-country collaborations for future BSC research.

### 4.3 Major themes and topics of BSC research

Each keyword that an author lists for their publication reflects the topic that they concentrate on in that publication (Lim 2023; Lim and Kumar 2023). In that sense, a collection of keywords that frequently appear together would reflect a common theme (Lim 2023; Zou et al. 2018). This is the fundamental premise of a co-occurrence analysis by means of keyword co-occurrences, which is a technique frequently used for science mapping in bibliometric analysis (Donthu et al. 2021; Lim 2023; Kumar et al. 2021). By engaging in a co-occurrence analysis of keywords, the nomological network of the field can be revealed (Mukherjee et al. 2022), making it possible to identify extant gaps, which can be used as a premise for recommending directions for future research (Castriotta et al. 2019). The temporal lens can also be

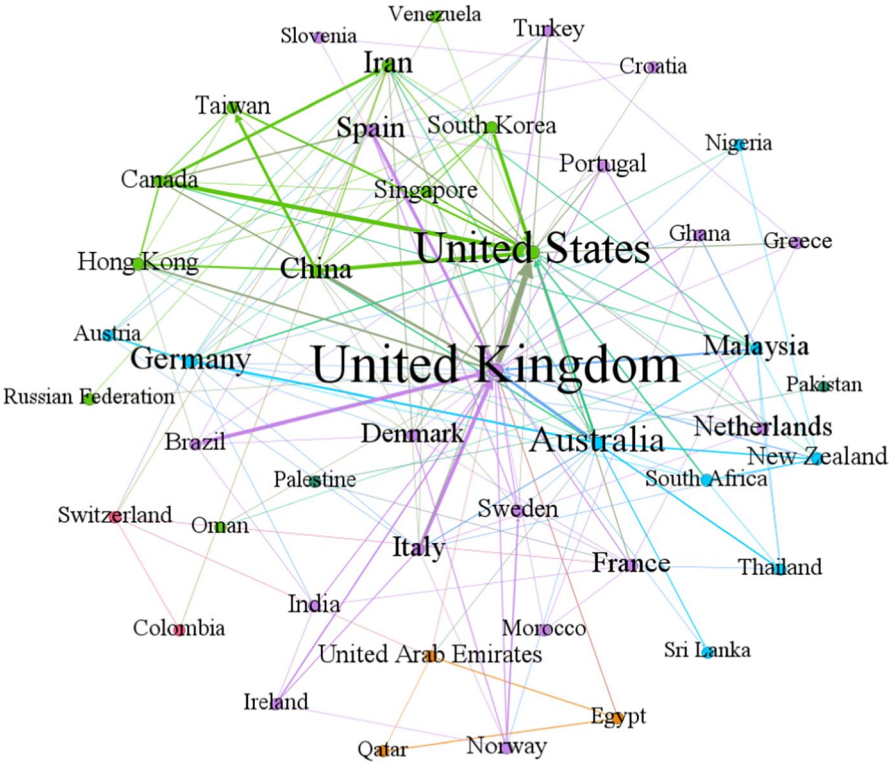


**Fig. 3** Co-authorship network of countries in BSC research

applied together with a co-occurrence analysis of keywords to aid in sensemaking (Lim and Kumar 2023), thereby providing finer-grained insights on the evolution of major themes and topics in the field (Mukherjee et al. 2022).

In this study, the corpus of BSC research is divided into three distinct periods: 1992–2001, 2002–2011, and 2012–2023. This division provides a reasonable time frame for examining the temporal shifts in BSC research over time. To facilitate analysis, a separate file in CSV format containing bibliographic information was created for each time period. Subsequently, each file was individually analyzed in the Gephi software, a network analysis and visualization software, to extract clusters using the modularity function (Bastian et al. 2009). The goal of engaging in this analytical endeavor was to gain insights into and map the temporal evolution of themes within BSC research.

The co-occurrence analysis of keywords indicates that the keyword "balanced scorecard" has 653 occurrences (OC), which is unsurprising given its centrality to BSC research. Other notable topics that have been studied in BSC research include "performance measurement" (OC: 131), "performance management (OC: 96)", "performance measures" (OC: 67), "performance evaluation" (OC: 50), "strategic management" (OC: 42), "organizational performance" (OC: 31), "supply chain

**Table 6** Temporal evolution of themes and topics in BSC research

| Period | Theme | Topics |
|---|---|---|
| 1992–2001 | Performance management | Corporate governance, Facilities management, Local government, Organizational performance, Performance evaluation, Performance management, Performance measurement, Performance measures, and Strategic management |
| | Knowledge management | Knowledge management, Maintenance, Management, Measurement, Performance, and Strategy |
| | Strategic planning | Quality function deployment and SWOT analysis |
| 2002–2011 | Strategic performance management | Business excellence, Business performance, Business strategy, Competitive strategy, Computer software, Construction industry, Continuous improvement, Control systems, Corporate strategy, Critical success factors, CRM, Data envelopment analysis, Decision making, E-commerce, Financial measures, Financial performance, Food industry, Health services sector, Higher education, Hospitals, Hotels, Innovation, Intellectual capital, International standards, IT, Knowledge management, Management accounting, Management control, Management strategy, National health service, Non-financial performance measures, Operations management, Organizational change, Organizational performance, Performance appraisal, Performance evaluation, Performance indicators, Performance levels, Performance management systems, Performance measurement, Police, Process management, Public sector organizations, Quality improvement, Quality management, Research and development, SMEs, Strategic change, Strategic planning, Strategic information systems, Strategic management, Strategy implementation, Strategy maps, Supply chain management, Sustainability, Total quality management, and Value chain |
| | Customer orientation | E-commerce, Quality function deployment, Project management, Strategic objectives, R and D management, Risk management, and SWOT analysis |
| | Financial and human resource management | Banking, Communication technologies, Human capital, Organizational culture, Sustainability balanced scorecard, and Wealth management |
| | Corporate governance | Activity-based costing, Benchmarking, Board of directors, Corporate governance, Corporate sustainability, and Responsive business scorecard |
| | Financial reporting | Accounting, Analytic network process (ANP), and Reporting |
| | Knowledge management | Institutional theory and Organizational learning |

**Table 6** (continued)

| Period | Theme | Topics |
|---|---|---|
| 2012–2023 | Strategic performance management | Actor network theory, Corporate social responsibility, Environmental performance, Environmental sustainability, Humanitarian logistics, Impact assessment, Innovation diffusion theory, Interpretive structural modeling, MCDM, Pragmatic constructivism, Sustainability reporting, Technology adoption, and Triple bottom line |
| | Integrated reporting | Business intelligence, Competitive advantage, Integrated performance management, Management accounting innovation, Management accounting, Organizational effectiveness, Strategic management accounting, and Strategic performance measurement |
| | Sustainability balanced scorecard | Corporate social responsibility (CSR), Corporate sustainability, Decision making, Environmental accounting, Fuzzy linguistic approach, Hospitality, Hotel performance, Integrative view, Soft systems methodology, and Sustainability balanced scorecard |
| | Sustainable development | Business strategy, Climate change, Food security, Health service, Strategic alignment, Sustainable development goals, and Sustainable development |
| | Systems thinking | Asset management, Humanitarian supply chain, Key performance indicators, Management cockpit, Organizational performance, Strategic performance management, Strategy implementation, Sustainability management, and Systems thinking |
| | Customer orientation | Customer satisfaction, New product development, Sustainability performance, and Theory of constraints |
| | Financial management | Banking industry and Integrated reporting |

management" (OC: 25), "intellectual capital" (OC: 24), "strategic planning" (OC: 24), and "sustainability" (OC: 20). To obtain greater clarity and in-depth understanding of these major topics and their contributions to the major themes in BSC research, the next sections shed light on the development of major themes and topics for BSC research over three decades since its inception. This temporal evolution is also summarized in Table 6 and Fig. 7.

#### 4.3.1 Period 1 (1992–2001)

The initial decade of BSC research is characterized by three major themes: *performance management* (purple cluster), *knowledge management* (orange cluster), and *strategic planning* (dark green cluster).

The most prominent theme in this decade is *performance management* (purple cluster). The keyword co-occurrences for this theme indicate that BSC, which is a "strategic management" tool for "performance measurement", "performance evaluation", and "performance management", has been studied in tandem with "corporate governance", "performance measures", and "organizational performance", including in the cases or situations involving "facilities management" and "local government".

The next major theme in this period is *knowledge management*. The keyword co-occurrences for this theme suggest that BSC is a useful tool for facilitating the "measurement", "management", and "maintenance" of the "performance" and "strategy" of "knowledge management".

The last noteworthy theme in timeframe is *strategic planning*. The keyword co-occurrences for this theme signal that BSC is a useful tool for "strategic planning" and provides a profound mechanism for managers to perform a "swot analysis", going beyond financial agenda and including non-financial agenda such as "quality function deployment", which accentuates the importance of listening and responding to customer voices.

In understanding the emergence and persistence of these themes during 1992 to 2001, one must consider the broader business and economic context of the era. The late twentieth century witnessed the rise of globalization and the nascent stages of the digital revolution (Autio et al. 2021). Consequently, businesses found themselves navigating an increasingly complex environment, necessitating refined tools for performance measurement and strategic direction. The prominence of *performance management* during this decade can be understood in light of these shifts. Companies needed to ensure not only profitability but also efficacy in their operations, making tools like the BSC vital for assessing both their financial and non-financial performance parameters.

Furthermore, the 1990s marked a period of heightened focus on information and its strategic importance (Donthu et al. 2023), leading to the emphasis on *knowledge management*. Organizations began recognizing that their competitive edge was not solely derived from tangible assets but also from their ability to manage, harness, and capitalize on organizational knowledge. The BSC, serving as a barometer of organizational performance, naturally found its place in assessing how knowledge assets influenced business outcomes.

Lastly, the emphasis on *strategic planning* can be tied back to the intense competition of the 90 s (Bettis and Hitt 1995). With markets expanding and businesses crossing borders, a structured approach to envisioning the future became imperative. BSC's utility in strategic planning, especially its ability to integrate non-financial parameters like 'quality function deployment' and emphasizing customer-centricity, catered perfectly to the era's demand. Managers needed holistic frameworks to anticipate challenges and opportunities in a rapidly evolving marketplace, explaining the integration of BSC into strategic planning processes during this decade.

#### 4.3.2 Period 2 (2002–2011)

The second decade of BSC research is characterized by six major themes: *strategic performance management* (pink cluster), *customer orientation* (black cluster), *financial and human resource management* (light green cluster), *corporate governance* (orange cluster), *financial reporting* (light blue cluster), and *knowledge management* (dark pink cluster).

The most prominent theme in this decade is *strategic performance management* (pink cluster). This theme is a combination of the *performance management* and *strategic planning* themes in the initial decade between 1992 and 2001, showing the maturity of research in this space, which is reaffirmed by the massive expansion of topics under this consolidated theme. The topics in this theme revolve around *aspirations* (e.g., "business excellence", "innovation", "quality improvement", "sustainability"), *functions* (e.g., "crm", "e-commerce", "IT", "research and development"), *resources* (e.g., "computer software", "intellectual capital"), *strategies* (e.g., "business strategy", "competitive strategy", "corporate strategy", "management strategy", "strategy maps", "strategy implementation"), "*strategic management*" (e.g., "critical success factors", "decision making", "organizational change", "strategic change", "strategic planning"), "*performance management systems*" (e.g., "continuous improvement", "control systems", "data envelopment analysis", "knowledge management", "management accounting", "management control", "operations management", "performance appraisal", "process management", "quality management", "strategic information systems", "supply chain management", "total quality management"), and "performance measurement" (e.g., "business performance", "international standards", "financial measures", "financial performance", "non-financial performance measures", "organizational performance", "performance evaluation", "performance indicators", "performance levels") across contexts (e.g., "construction industry", "food industry", "health services sector", "higher education", "hospitals", "hotels", "national health service", "police", "public sector organizations", "SMEs", "value chain"). Notably, the merging of *performance management* and *strategic planning* into *strategic performance management* can be attributed to several factors. First, the evolving business landscape necessitated a more integrated approach, where strategy and performance are not viewed in isolation but as intertwined facets of successful business operations. Second, advancements in management theory and practices highlighted the synergies between strategic planning and performance metrics, emphasizing their mutual reinforcement. Third, the rise of data-driven

decision-making has underscored the importance of aligning strategic objectives with quantifiable outcomes, thus pushing these themes to converge.

The ensuing major theme in this duration is *customer orientation* (black cluster). This is a new theme that represents the focus on customer orientation in the BSC. This is seen in the BSC's engagement with "quality function deployment" in achieving "strategic objectives" by transforming customer requirements into product and production planning and development, including in "electronic commerce", with the insights derived from "r and d management" and "swot analysis" as part of "project management" and "risk management".

The following noteworthy theme in this era is *financial and human resource management* (light green cluster). This is a new theme that explores the utility of the BSC in finance (e.g., "banking", "wealth management") and human resource (e.g., "communication technologies", "human capital", "organizational culture"). The emergence of "sustainability balanced scorecard" in this theme is also noteworthy, signaling the importance of sustainability in economic and non-economic aspects of performance management.

The next primary theme in this interval is *corporate governance* (orange cluster). This is also a new theme that highlights the importance of "corporate governance" (e.g., "activity-based costing", "board of directors") and the value of the BSC (including its extrapolation in the form of the "responsive business scorecard") as a "benchmarking" tool to safeguard "corporate sustainability".

This period also showed some niche extrapolations—they relate to *financial reporting* (light blue cluster) and *knowledge management* (dark pink cluster), respectively. The former is a new theme that concentrates on "reporting" from the "accounting" perspective and leverages "analytic network process (anp)", whereas the latter is a recurring theme that focuses on "organizational learning" from the "institutional theory" perspective.

Several factors may account for the emergence and persistence of these themes from 2002 to 2011. The early 2000s experienced an unprecedented surge in technological advancements and globalization, leading to an increased emphasis on *customer orientation* as businesses sought to differentiate themselves in a rapidly expanding market (Lim, Kumar et al. 2023a, b). The need to understand and cater to the customer's unique preferences and greater exposure to information, especially in the age of electronic commerce, made it essential to embed customer orientation in strategic decision-making tools like the BSC.

Additionally, the 2007–2008 global financial crisis underscored the necessity of robust *financial and human resource management*. Organizations realized the need to integrate financial metrics with human capital indicators in their performance evaluation systems, giving rise to themes that amalgamated financial and HR perspectives in the BSC. This era also witnessed increasing scrutiny around *corporate governance* practices, in light of major corporate scandals and failures (Cuenca et al. 2022; Zaidi and Jamshed 2023). Consequently, tools like the BSC became pivotal in reinforcing good governance practices and ensuring corporate sustainability.

Lastly, the nascent information age led to the acknowledgment of knowledge as a pivotal asset (Chopra et al. 2021; Donthu et al. 2023). Hence, *knowledge management*, supported by growing digital databases and communication technologies,

found its place as a recurring theme. Simultaneously, with the rise of complex business ecosystems, there was a growing need for transparent *financial reporting*, making it another key focus area during this period.

#### 4.3.3 Period 3 (2012–2023)

The most recent works on BSC research is characterized by seven major themes: *strategic performance management* (pink cluster), *integrated reporting* (black cluster), *sustainability balanced scorecard* (light green cluster), *sustainable development* (orange cluster), *systems thinking* (light blue cluster), *customer orientation* (dark pink cluster), and *financial management* (dark green cluster).

The most dominant theme in this era is *strategic performance management* (pink cluster), which is a recurring theme from the last two decades (1992–2011). The scope of topics studied remain relatively similar with the previous decade (2002–2011), with the exception of growing interests around sustainability (e.g., "corporate social responsibility", "environmental performance", "environmental sustainability", "humanitarian logistics", "impact assessment", "sustainability reporting", "triple bottom line") and technology (e.g., "technology adoption), as well as new methods (e.g., "interpretive structural modeling", "mcdm"), philosophies (e.g., "pragmatic constructivism"), and theories (e.g., "actor network theory", "innovation diffusion theory") being explored more prominently.

This decade of BSE research also marks important contribution on *integrated reporting* (black cluster), which represents a larger theme emerging out of the niche theme, *financial reporting*, in the previous decade (2002–2011). The keyword co-occurrences for this theme show that "integrated performance management" leverages on "business intelligence", "management accounting", "management accounting innovation", and "strategic management accounting" for "strategic performance measurement", resulting in "competitive advantage" and "organizational effectiveness".

*Sustainability balanced scorecard* (light green cluster) also appeared as a major theme in this period. This theme reflects an important development in BSC research, wherein the BSC is infused with a sustainability focus in response to the growing sustainability issues in today's world. The keyword co-occurrences show that "sustainability balanced scorecard" offers an "integrative view" that safeguards "corporate sustainability", taking into account "corporate social responsibility (csr)" and "environmental accounting" into "decision making" across contexts (e.g., "hospitality", "hotel performance"). Among the noteworthy methods leveraged for this theme during this decade include "fuzzy linguistic approach" and "soft systems methodology".

The next noteworthy theme in this interval is *sustainable development* (orange cluster). This theme reaffirms the third BSC research theme on the responsiveness of BSC research toward addressing the growing sustainability issues that the world is facing today. The keyword co-occurrences for this theme show that the BSC facilitates "strategic alignment" between "business strategy" and "sustainable

development", addressing issues such as "climate change", "food security", "health service", and more broadly, "sustainable development goals".

The recent BSE research in this period also focuses on *systems thinking*, which is highlighted in (light blue cluster). This is a new theme that highlights the importance of "systems thinking" in the "management cockpit" of "strategic performance management". That is to say, a holistic and interconnected perspective is needed for "strategy implementation", which may involve identifying, monitoring, and acting on "key performance indicators" of "organizational performance" across various functions in an organization, including "asset management" and "sustainability management", as well as contexts (e.g., "humanitarian supply chain").

The subsequent prominent theme in this phase is *customer orientation* (dark pink cluster). This is a recurring theme from the previous decade (2002–2011) that has expanded in the recent decade (2012–2023). The keyword co-occurrences show that "customer satisfaction" should be a central consideration among organizations from commercial (e.g., "new product development") and non-commercial (e.g., "sustainability performance") perspectives. The "theory of constraints" is also a noteworthy theory that has informed research in this space, showing that organizations will need to balance economic, environmental, and social considerations when serving customers today who are becoming increasingly sustainability conscious.

The recent timeframe also marks the BSC's utility in in *financial management* (dark green cluster). This is partially a recurring theme from the previous decade (2002–2011) on *financial and human resource management* that has shrunk in focus and size in the recent decade (2012–2023). The co-occurrence analysis of keywords shows that "integrated reporting" and the "banking industry" are key topics under this theme. Nonetheless, it is likely that this theme will disappear in the future, potentially merging into the second major theme in the present decade (i.e., *integrated reporting*).

The evolution of the themes in BSC research from 2012 to 2023 mirrors broader changes in the global business environment. The persistence and dominance of *strategic performance management* as a theme underscore its continued relevance in navigating complex market dynamics and enhancing organizational efficacy. The seamless integration of strategy with performance metrics remains vital for organizations aiming for longevity and sustained success. This is also in line with the continued importance and relevance of strategic leadership (Singh et al. 2023).

Additionally, the burgeoning emphasis on sustainability themes, as seen with *sustainability balanced scorecard* and *sustainable development*, resonates with the escalating global awareness around environmental and social issues. This period witnessed unprecedented global consensus on the urgency of addressing climate change, conserving biodiversity, and ensuring social justice, as enshrined in global agendas like the United Nations' Sustainable Development Goals and the Paris Accords in response to global challenges like climate change and poverty (Azmat et al. 2023; Lim 2022a). Noteworthily, businesses today are no longer mere economic entities; they are entrusted with larger societal responsibilities. Their performance metrics, thus, have evolved to reflect a balance of economic prosperity, environmental stewardship, and social responsibility.

Besides that, the emergence of *integrated reporting* and its subsequent growth signifies the world's growing demand for transparency and accountability in business. Stakeholders today, from investors to consumers, seek a holistic understanding of a company's operations, encompassing not just financial metrics but also that on environmental, social, and governance (ESG) (Bansal et al. 2023; Lim, Ciasullo et al. 2023; Mahajan et al. 2023). This comprehensive view provides a clearer picture of a company's ethical stance and long-term viability.

Furthermore, the rise in *systems thinking* reflects the world's growing interconnectedness (Sandberg and Abrahamsson 2022). Businesses today operate in intricate networks, from supply chains that span continents to digital platforms that link disparate entities (Kumar et al. 2023; Sahoo et al. 2023). A systems perspective allows organizations to make sense of these complexities and understand the ripple effects of their decisions, ensuring that strategies are both holistic and adaptive.

Moreover, customer orientation's continued relevance points to the changing dynamics of the customer-business relationship. Today's customers are more informed, empowered, and discerning (Lim 2019, 2020a, b). Their preferences have shifted towards businesses that not only provide quality products and services but also align with their values, especially around sustainability (Lim 2022a, b). This shift is not just a trend but a deeper societal transformation, highlighting the role businesses play in shaping and being shaped by societal norms.

Lastly, the potential phasing out of the financial reporting theme in favor of *integrated reporting* underscores a transition in business reporting paradigms. While financial metrics remain crucial, they are increasingly seen as one facet of a multidimensional performance narrative, which includes ESG dimensions (Lim, Ciasullo et al. 2023). As businesses and their stakeholders become more attuned to this holistic performance perspective, themes that once stood distinct are likely to merge, reflecting a more integrated understanding of business success.

## 5 Conclusion

### 5.1 Key takeaways

The present study offers a systematic review of BSC research over three decades (1992–2023) since the strategic performance measurement and management tool was originally developed by Kaplan and Norton (1992) and published in *Harvard Business Review*. Using bibliometric analysis involving performance analysis and science mapping via co-authorship analysis and co-occurrence analysis of keywords, this study has unpacked nuanced insights pertaining to (i) the publication trend, (ii) the top journals, (iii) the most influential (global citation) and prestigious (local citations by highly cited articles) publications, (iv) the major author groups, (v) the country collaboration network, and (vi) the major themes and topics for BSC research. This study revealed that BSC research is (i) on a bell-curve trajectory, (ii) published in multidisciplinary high-quality journals, (iii) contributed by numerous author groups around the world, and (iv) expanded in terms of its nomological network of thematic and topical coverage over three decades since


**Fig. 4** Co-occurrence network of author keywords for BSC research between 1992 and 2001. *Notes* Theme 1 = Performance management (purple cluster). Theme 2 = Knowledge management (orange cluster). Theme 3 = Strategic planning (dark green cluster)

existence (1992–2023). The declining trend in the productivity and popularity of BSC research is concerning. However, this issue could be addressed by introducing new ideas that would revitalize the BSC and establish its relevance to current management practices, which is in line with the goal of review studies such as the one herein and thus will be discussed further in the following section.

### 5.2 Future directions

Moving forward, there is a clear need to stimulate new, meaningful BSC research in order to correct its publication trajectory towards a direction reflecting positive growth. Reflecting on the evolution of major themes in BSC research (Figs. 4, 5, 6), three potentially fruitful directions for future research are proposed.

*First*, many organizations around the world have suffered from the adversity of the unprecedented COVID-19 pandemic (Islam 2023; Sarwar et al. 2023; Sutarto et al. 2022). With the changes in customer behavior and the global marketplace (Lim, Kumar et al. 2023a, b), the importance of financial resilience (Baker et al. 2023), and the ability to adapt to externalities with agility being noteworthy contemporary lessons (Heidt et al. 2023), especially following the COVID-19 pandemic (Lim 2021, b), it is important that future BSC research explore and propose suitable

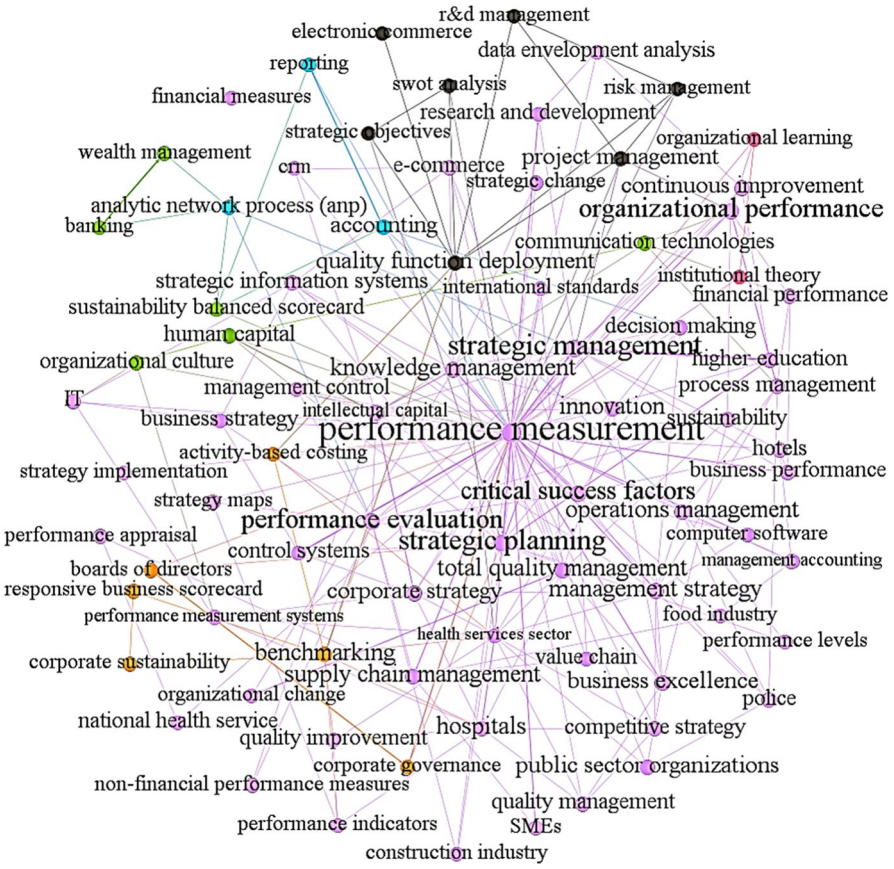


**Fig. 5** Co-occurrence network of author keywords for BSC research between 2002 and 2011. *Notes* Theme 1 = Strategic performance management (pink cluster). Theme 2 = Customer orientation (black cluster). Theme 3 = Financial and human resource management (light green cluster). Theme 4 = Corporate governance (orange cluster). Theme 5 = Financial reporting (light blue cluster). Theme 6 = Knowledge management (dark pink cluster) (colour figure online)

modifications and mechanisms to the BSC to improve its utility and relevance in the new normal. Such efforts should strive to enhance the adaptability of the BSC and educate organizations on how they can go about adapting the BSC in response to externalities with greater agility, efficiency, effectiveness, and success. This should contribute to meaningful extensions to BSC's body of knowledge on *strategic performance management*.

*Second*, continuing BSC research on *integrated reporting* is highly encouraged in light of growing sustainability issues (Castillo 2022; Lim 2022a) and stakeholder pressures to hold organizations accountable for their economic, environmental, and societal impact (Lim, Ciasullo et al. 2023; Tipu 2022). While many organizations have begun to participate in environmental social governance (ESG) activities and reporting, they may be doing so for reasons associated to compliance (Kotzian 2023;

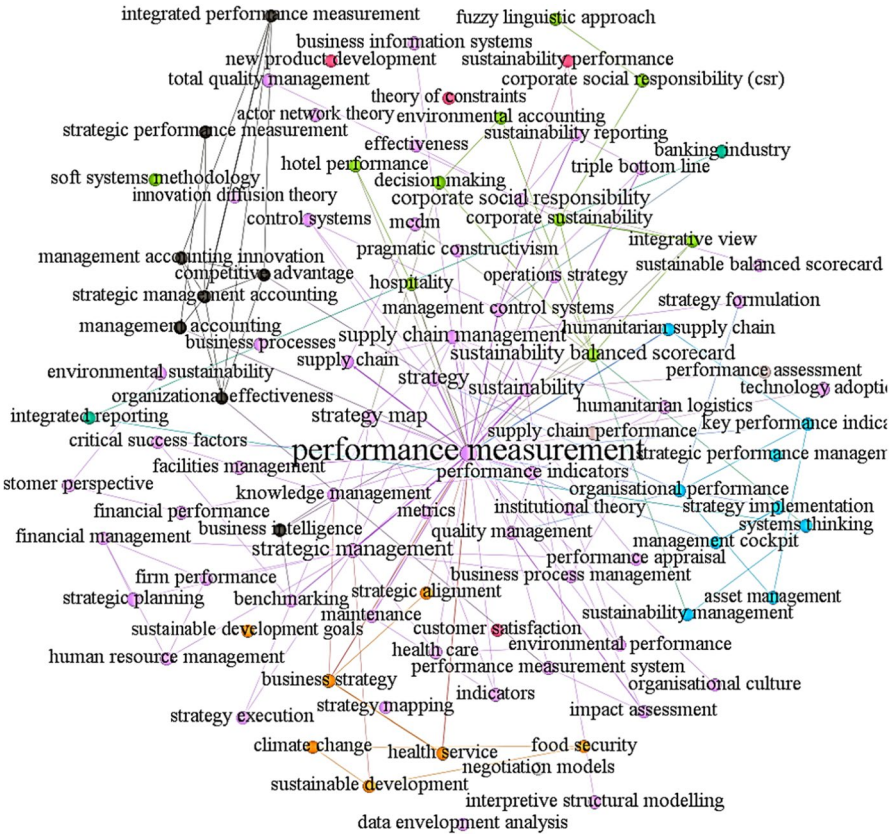


**Fig. 6** Co-occurrence network of author keywords for BSC research between 2012 and 2023. *Notes* Theme 1 = Strategic performance management (pink cluster). Theme 2 = Integrated reporting (black cluster). Theme 3 = Sustainability balanced scorecard (light green cluster). Theme 4 = Sustainable development (orange cluster). Theme 5 = Systems thinking (light blue cluster). Theme 6 = Customer orientation (dark pink cluster). Theme 7 = Financial management (dark green cluster) (colour figure online)

Prasad et al. 2022) rather than continuous improvement (Lim, Ciasullo et al. 2023). In this regard, the BSC, which links strategy, measures, and initiatives, could play a crucial role in driving purpose in organizational activities and the reporting of such activities. Therefore, future studies are encouraged to explore the role of the BSC and how this strategic performance measurement and management tool can be used to enhance the activity and outcome of integrated reporting (Fig. 7).

*Third*, the importance of *sustainable development* has never been greater following the COVID-19 pandemic, where the world has regressed rather than improved in its performance across the sustainable development goals (Lim 2022a). Taking a leaf out of this noteworthy observation, future BSC research must explore new ways to extrapolate the BSC for the purpose of making better progress towards sustainable development. New research in this direction should also adopt a *systems thinking* approach, ensuring that no stakeholder gets left behind, as well as a *customer orientation*

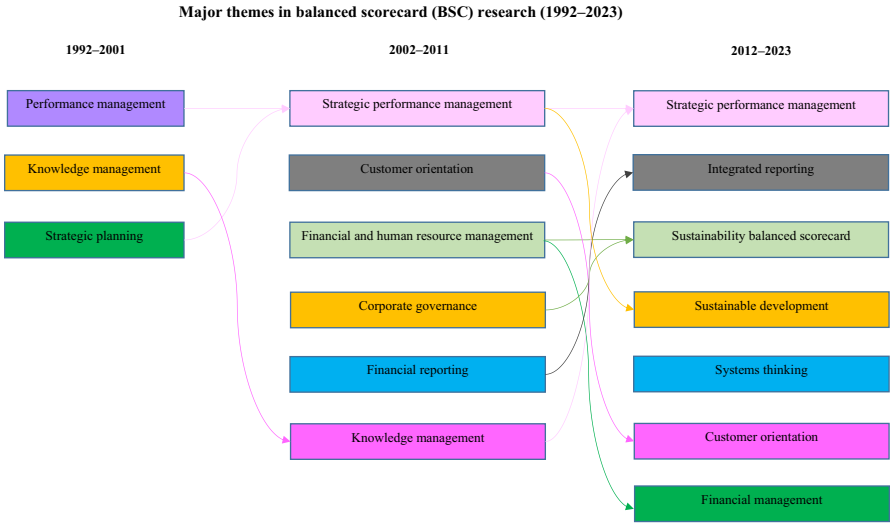


**Fig. 7** The evolution of BSC research (1992–2023)

approach, so that initiatives are developed, implemented, and monitored with the all potential beneficiaries in mind. It also important that financial viability and value maximization are always kept in mind, and add-ons to the BSC that can support organizations in doing so should be potentially fruitful. This is also logical given that the BSC is not a superior replacement but rather a complementary strategic performance measurement and management tool. Such efforts in this direction should therefore make profound contributions to the upgrade of the *sustainability balanced scorecard*, the utility of *systems thinking* and *customer orientation*, the extension of scope for *financial management*, as well as the impact of the BSC on *sustainable development*.

*Finally*, new research that explores new-age technologies such as artificial intelligence (Åström et al. 2022; Santana and Díaz-Fernández 2023) and blockchain (Alaassar et al. 2023; Sun et al. 2023) is highly encouraged to ensure that the BSC continues to stay relevant in the latest industrial revolution (Calderon-Monge and Ribeiro-Soriano 2023). Numerous scholars have showcased the use of innovative methodologies (e.g., fuzzy analytic network process-based approach to the BSC for collaborative decision-making; Bhattacharya et al. 2014) to enhance the efficacy and impact of the BSC. However, new efforts should be made to explore how managers can use artificial intelligence to automate the BSC and develop useful information that can help them take timely actions. Similarly, the utility of blockchain for measuring and monitoring initiatives on the BSC should also be explored, including the ways how this could be implemented. Such efforts, when taken collectively, should extend the scope of BSC research meaningfully, and hopefully, put the progress of the field back on a positive growth trajectory.

### 5.3 Limitations

Albeit the retrospective and prospective contributions that we have delivered herein, we concede several limitations, which, when viewed positively, may pave a meaningful way for future review studies on the BSC.

*First*, this study remains constrained to overarching insights on 31 ½ years of the BSC. While the bibliometric analysis did provide a comprehensive analysis of the performance and a rigorous mapping of the science in BSC research, it could not deliver finer-grained insights pertaining to the constructs, relationships, and potential tensions and contradictory findings in the field. In this regard, future scope avails for new reviews that invest attention to any of the major themes revealed through the present study—an endeavor consistent with Lim et al. (2022a, b), who emphasized that review studies should not be viewed in competition but rather as a collaborative effort to enrich understanding of the field's progress in multifaceted ways.

*Second*, this study is limited to the studies that were available on Scopus. In addition, best efforts were taken to ensure that no predatory journals were included in the review by utilizing established rating and ranking mechanisms as quality filters. Nonetheless, there is a possibility that new and emerging ideas may have been overlooked, since this study did not consider conference papers nor alternative publication outlets other than journals. While this was a justified decision on the basis that journals often published completed work (rather than work in progress) and that quality filters help weed out potential low-quality research findings, it cannot be discounted that certain insights or perspectives could have been overlooked in this study. As we do not wish to encourage new review studies to consider alternative outlets or sources unnecessarily, we believe that a more pragmatic suggestion would be to engage in new reviews of the BSC periodically. This could be done for BSC in general or in specific contexts (e.g., geographic regions, industries), thereby providing updated insights from new perspectives in meaningful ways.

Taken collectively, this article has delivered on its goals using an established review method, and thus, the insights that it delivers should be useful for gaining a comprehensive and updated understanding as well as a source of inspiration for the next generation of BSC research.

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