
Future Prospects in Balanced Scorecard Research: Sustainability Perspective

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Abstract: This paper reviews the state of the research on a balanced scorecard (BSC) and sustainability balanced scorecard (SBSC) from 1990 to 2020. It aims to address the research question, “What are the future prospects in the BSC research from the perspective of sustainability?” using an integrative literature review method with bibliometric analysis. This study also reports the evolution and synthesis of published materials, citation analysis, themes, theories, and the literature gap and future research agenda, including the post coronavirus disease 2019 (COVID-19) sustainability crisis. The findings of this study, which aim to advance the knowledge in the field, include the developed future research framework matrix and the proposed research questions regarding the research gap in the multi-dimensional, multi-disciplinary, and multi-cultural empirical research. This study is considered unique owing to its comprehensive, holistic, and up-to-date structure. Furthermore, such a research design facilitates interdisciplinary, theory-driven research with the review in multiple disciplines, which is new to the accounting literature. One limitation of this study is that it is a conceptual study; however, it can pave the way for future empirical and mixed-method studies in this field.

Keywords: balanced scorecard (BSC), bibliometric analysis, future research, integrative literature review, sustainability balanced scorecard (SBSC).

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INTRODUCTION

The root of environmental management accounting (EMA) can be traced back to the 20th century. Environmental management was first initiated into management accounting to minimize waste and environmental pollution and to reduce the corporations' environmental impact while increasing financial profitability (Bouma & Veen, 2004). The alarming evidence of the emerging environmental issues and coronavirus disease 2019 (COVID-19) crisis have proved that minimizing waste and pollution are not adequate but optimal solutions for the environment and limited natural resources are needed. We need environmentally benign systems to prevent, protect, enhance, and improve the condition of our natural world (Birkin, 1996;



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Freedman & Jaggi, 2000; Xiaomei, 2004). Investors and the general public sincerely demand sustainability-centered strategies, environmentally sensitive accounting systems, and disclosure of sustainability performance, which all became the necessity for stakeholders (Nurim & Asmara, 2019; Riduwan & Andajani, 2019). Particularly, COVID-19 pandemic, a sign of overexploitation of nature and the environment, has stressed the importance of sustainability (Barneveld et al., 2020; Gore & Blood, 2020). Thus, a sustainability balanced scorecard (SBSC), as an EMA tool, has gained more importance than ever post COVID-19. Balanced scorecard (BSC) and SBSC are salient practices for the environment and businesses.

Specifically, SBSC is a contemporary topic allowing future studies, so it is worthwhile to provide scholars with a framework or classification for the sake of future research in the field or to create new theoretical models. In other words, the *main goal* of this study is to respond to the research question of “what are the future prospects in the balanced scorecard research from the perspective of sustainability.” To do so, bibliometric analysis and integrative review are conducted to figure out “the research gaps, emerging themes, and relevant theories linked to these themes,” as disclosed in Figure 4 in the Result section. To clarify, integrative review, different than a traditional systematic review, does not aim to cover all articles ever published on the topic. Instead, its purpose is to critique, synthesize, narrow, or broaden the themes to help the scholars create new theoretical models and realize the overlooked research areas (Snyder, 2019; Torraco, 2005).

Furthermore, as a second goal, this multi-disciplinary study will answer the following research questions: *Which journals are most dedicated to the theme? Which studies are the most influential in the field to cite? What are the major research areas and key themes that have been investigated by the previous scholars? And What areas are understudied and what are the emerging themes and theories to conduct future research for?*

As new and path-breaking to accounting literature, this study’s holistic, comprehensive, up-to-date, and multi-disciplinary perspectives contribute to both BSC and SBSC literature because the prior review studies of Hansen and Schaltegger (2016) and Hoque (2014) were limited to accounting, business, and management journals. They focused on either BSC or SBSC and on a single aspect of SBSC, e.g., architecture. They were not up-to-date because their review lasted until 2013. In contrast, this paper has reported the current state of the research on BSC and SBSC both in the Web of Science database and Google Scholar, including journals, books, book chapters, book reviews, proceedings, presentations from multiple disciplines, and languages and from 1990 to 2020. Besides, it defines the new themes in SBSC research post COVID-19. The results of this study and the developed (S)BSC future framework matrix (Figure 4) will lead to new research to advance knowledge in the field and it will motivate the businesses to use more environmentally benign management and accounting tools, which is profoundly demanded by the stakeholder after COVID-19.

BSC was designed to provide information about the performance of the organizations at a strategic level, so it links the performance measures to the business unit strategy to improve strategic alignment (Kaplan & Norton, 1992). BSC provides a strategic action process within four steps: formulation and implementation of vision and strategy; communicating and linking; business planning; and strategic feedback and learning (Schaltegger & Burritt, 2017). Even though the BSC was developed by Kaplan and Norton (1992), the conventional balance scorecard was modified for sustainability (SBSC) by Epstein and Wisner (2001), Figge et al. (2002a), and Figge et al. (2003). SBSC, stakeholder-centered, plays a prominent role in developing a well-defined sustainability strategy because it is an only tool focusing on financial and non-financial perspectives, past, present, and future costs, and short-term and long-term sustainable performance at the same time (Bartolomeo et al., 2009; Riana et al., 2015).

In the prior literature, the majority of the (S)BSC research was conceptual and it was in the management and accounting disciplines. For the BSC, the performance measurement indicators, strategic planning, and implementation of BSC in various sectors were the themes generally studied. The predominant themes in SBSC

research were as follows: the architecture (frameworks) of the SBSC, its impacts on sustainable firm performance, corporate strategy, strategic management, and its implementation in various sectors. On the contrary, recent studies in the SBSC field, between 2015 and 2020, have shifted the focus to computer science and environmental sciences by researching on fuzzy-based and analytic network process (ANP)-based SBSC, sustainable value creation, and environmental investment decision making, as well as the supply chain, the architecture of SBSC, and the case studies in the business domain.

As a result of the synthesis and analysis, this paper found the overlooked themes and research gaps in the (S)BSC research, which are discussed in detail in the “Results” and “Conclusion” sections. Overall, it is found that the majority of the conceptual studies was without quantitative or qualitative methodology and in British or American settings. In short, multi-cultural, multi-disciplinary, theory-driven, and empirical research are needed in the understudied emerging areas of computer science, social and political economics, and social sciences, such as ethics, sociology, and psychology. In the business domain, stakeholder value creation, resilient and sustainable organizations after COVID-19, institutional entrepreneurship, corporate governance, and human capital management are the areas lacking research on (S)BSC. Specifically, COVID-19 has initiated new themes of dynamic, resilient, and nimble framework for SBSC, SBSC in turbulent times, and risk-based SBSC.

METHODS

This paper has followed the methods by Martens et al. (2016), Linnenluecke et al. (2020), Snyder (2019), and Torraco (2005) to conduct an integrative review through bibliometric analysis. The integrative review allows diverse methodologies to contribute to future research avenues in the new and emerging themes of the phenomenon (Perkumiene & Pranskuniene, 2019). In other words, there is no single agreed-upon approach for conducting integrative reviews (Torraco, 2005). However, the integrative review is useful when the aim of the research is not to cover all articles ever published on the topic, but to critique, synthesize, narrow, or broaden the themes to create a framework or classification for the sake of the future research in the field or to create new theoretical models. Thus, an integrative review’s search strategy is not systematic (Snyder, 2019). In this paper, similar to the research approaches of Martens et al. (2016), Linnenluecke et al. (2020), and Zha et al. (2020), the bibliographic analysis was conducted to seek the previous literature on BSC and SBSC, and then, they were synthesized and the emerging themes and future research agenda were presented. Bibliometric analysis is a tool to identify the journals dedicated to the theme, the gurus and most-cited scholars and studies in the field, evolution of the topic, and identification of the key themes (Martens et al., 2016). The search and review process of this study is depicted in Figure 1 in detail.

As three stages illustrated in Figure 1, after the initial search attempt with the terms “Balanced Scorecard,” “Sustainability Balanced Scorecard,” “Sustainable Balanced Scorecard,” “Green Balanced Scorecard,” and “Eco-balanced Balanced Scorecard,” “Environmental Balanced Scorecard,” and “Balanced Scorecard for sustainability” between 1990 and 2020, the richer and wider range of publications are collected (stage 1). Then, in stage 2, the sample is refined by reviewing the titles, abstracts, and full texts to concentrate on the articles, books, book chapters, book reviews, and proceedings that are explicitly, directly, and precisely connected to the topic. It was refined to 1,153 publications for BSC in the Web of Science and 70 (203) publications for SBSC in the Web of Science (in Google Scholar). In the final stage, the results are presented through the analyses of the evolution, citation, journals, and publications. Then, the indicators and key themes are mapped. Finally, future research agenda and relevant theories to develop new theoretical models are provided for the SBSC and BSC research.

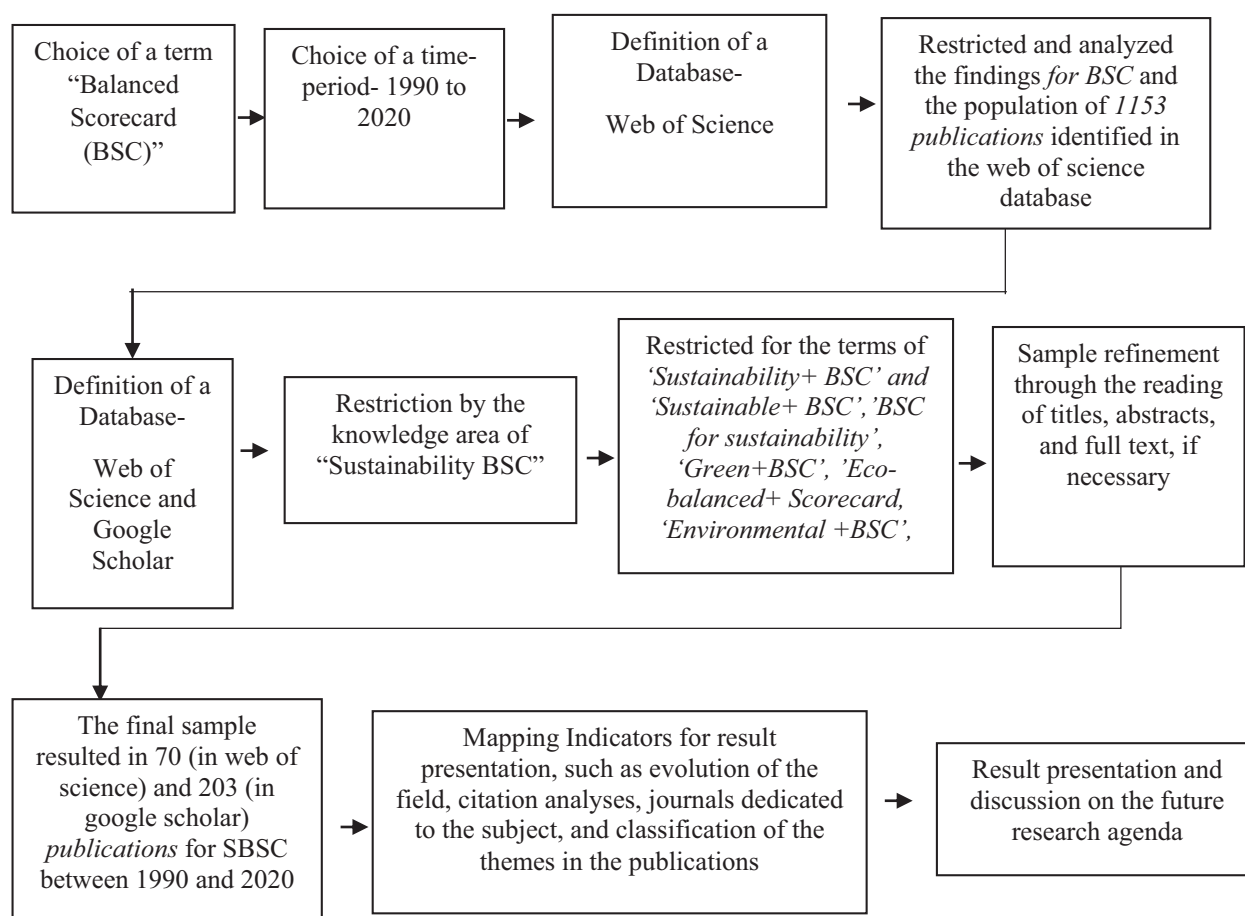


Figure 1 Flow of the Bibliometric Analysis Source: Prepared by the Author, Derived by Martens et al. (2016)

In this review, the Web of Science database, including all databases and all materials in all languages, is utilized for BSC and SBSC publications. Besides, for the SBSC, the Google search engine is also used to locate the additional publications on SBSC with the help of the *Publish and Perish* software program.

RESULTS AND DISCUSSION

The evolution, frequency distribution, citation analysis, and influential scholars are illustrated for the BSC as a field of interest for scholars. The evolution of the scientific production by years (from 1992 to 2020) in the Web of Science database (total of 1,153 publications) is illustrated in Figure 2, which yields a clue to the scholars about the demand in the field. There is an increasing trend in BSC research from 1992, when Kaplan and Norton developed BSC, to 2017. It reached a peak state in 2017 with 117 publications per year, which is evidence of remarkable interest in this field and the importance of the topic for academia and practice (Figure 2). After the peak state in 2017, the reasonable amounts of manuscripts were published in 2018 (82 publications) and 2019 (71 publications). The average publication per year between 1992 and 2020 was 41. The majority (75%) of these publications was in English and were focused mainly on American and British settings. It means that there is still a need for multi-cultural studies in this field.

Table 1 discloses the top 10 most cited publications in the BSC field. These articles are the main reference points for the researchers who want to publish in this area in the future. The citation analysis indicates the gurus

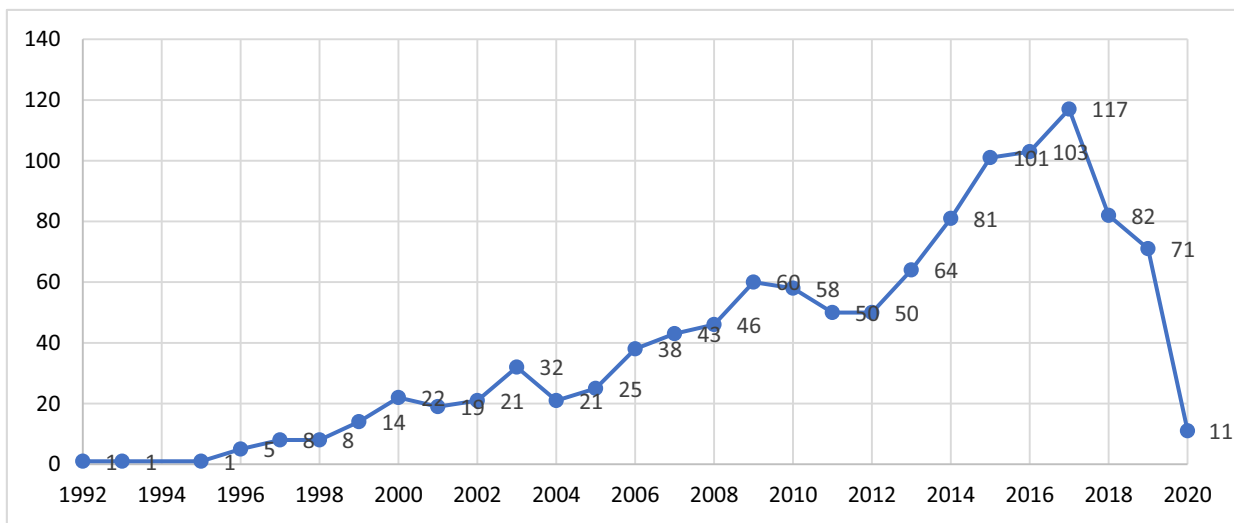


Figure 2 Publication Trend by Year for Studies on BSC (2020 is until by March) Source: Prepared by the Author (Based on the Data in the Web of Science Database)

of the field. For instance, Kaplan and Norton's publications have been cited more than 6,000 times. In the business discipline, Kaplan, Norton, Hoque, James, Ittner, Larcker, Meyer, Lipe, and Salterio are the mostly cited scholars. In computer and engineering sciences, Bhagwat, Sharma, Ravi, Shankar, and Tiwari are the most influential scholars on the BSC studies. Hoque and James (2000), Kaplan and Norton (1992), Kaplan and Norton (1996b), Kaplan and Norton (1996a), Ittner et al. (2003), Lipe and Salterio (2000), and Banker et al. (2004) examined the association among BSC, organizational strategy and performance measures, and strategic management systems. On the contrary, Bhagwat and Sharma (2007) proposed BSC for supply chain management that evaluates day to day business operations, maps, and analyzes supply chains. Norreklit (2003) approached the BSC concept from another point of view and conducted the rhetorical analysis of BSC. In computer and engineering sciences, Ravi et al. (2005) proposed a model in which the dimensions of reverse logistics for the end-of-life (EOL) computers were taken from the four perspectives (financial and non-financial) of a BSC. The purpose was to combine reverse logistics, EOL, ANP, and BSC approaches to provide a holistic framework and system.

Scientific journals with more than five articles on BSC are shown in Table 2. Sixteen journals out of 25 are ranked in either Social and Science Citation Information (SSCI) list or AJG (Academic Journal Guide or ABS) list. The top three most dedicated (ranked) journals to BSC research are *Expert Systems with Applications*, *Total Quality Management Business Excellence*, and *Sustainability*.

The research areas, main themes, and the synthesis of the prior research on BSC are outlined. The major research areas and themes studied in the BSC research are summarized in Tables 3 and 4, respectively. The distribution of BSC publications by major research areas is shown in Table 3. More than half (56%) of the prior research is in the business and economics area, and the rest are in computer science and engineering (18%), health science (14%), and social sciences (other than business and economics, 12%). We should push the BSC research forward to the computer science sub-field of artificial intelligence, information management, and computational intelligence. There is very scarce research in these sub-fields, so the prospective research has a higher chance to get published in the high-ranked journals.

Table 4 illustrates the cluster of themes in BSC research. The majority of the prior research has focused on performance measurement and key performance indicators (KPIs; 29%), linking BSC to firm strategy and

Table 1 Top 10, Most Cited Publications in the BSC Literature

Title	Author (Year)	Source Title	Total Citations
The Balanced Scorecard—Measures that Drive Performance	Kaplan and Norton (1992)	Harvard Business Review	3,972
Linking Balanced Scorecard Measures to Size and Market Factors: Impact on Organizational Performance	Hoque and James (2000)	Journal of Management Accounting Research	1,460
Using the Balanced Scorecard as a Strategic Management System	Kaplan and Norton (1996b)	Harvard Business Review	1,403
Putting the Balanced Scorecard to work	Kaplan and Norton (1995)	Book chapter	625
Linking the Balanced Scorecard to Strategy	Kaplan and Norton (1996a)	California Management Review	360
Subjectivity and the Weighting of Performance Measures: Evidence from a Balanced Scorecard	Ittner et al. (2003)	Accounting Review	339
The Balanced Scorecard: Judgmental Effects of Common and Unique Performance Measures	Lipe and Salterio (2000)	Accounting Review	334
Performance Measurement of Supply Chain Management: A Balanced Scorecard Approach	Bhagwat and Sharma (2007)	Computers & Industrial Engineering	278
Analyzing Alternatives in Reverse Logistics for End-of-Life Computers: ANP and Balanced Scorecard Approach	Ravi et al. (2005)	Computers & Industrial Engineering	251
The Balanced Scorecard: What is the Score? A Rhetorical Analysis of the Balanced Scorecard	Norreklit (2003)	Accounting Organizations and Society	230
The Balanced Scorecard: Judgmental Effects of Performance Measures Linked to Strategy	Banker et al. (2004)	Accounting Review	210

Source: Prepared by the Author (Based on the Data in the Web of Science Database)

strategic planning (18%), and the adaptation, implementation, application (case studies) of BSC in various sectors and governmental and non-governmental institutions (21%). This analysis points out the further research avenues in the emerging themes of SBSC, green BSC, artificial intelligence, information systems, employee and management performance dimension, and cause and effect links between the BSC four perspectives and corporate strategy.

The most cited recent studies on BSC research between 2015 and 2020 are illustrated based on the areas of research and year in Table 5. As depicted in Table 5, decision making (MCDM and DEMATEL), analytical hierarchical process (AHP), and fuzzy-based BSC, actor-network theory (ANT)-based BSC, enterprise resource planning (ERP), and cloud computing in BSC are popular topics in computer science. On the contrary, in the business domain, the most cited articles between 2015 and 2020 are on the topic of BSC and stakeholder value maximization, innovation, total quality management (TQM), ethics, merit-based incentive payment, and implementation of BSC in the hospital and automotive industries.

In addition to the most cited articles in Table 5, Zhao et al. (2020), Zawawi and Hoque (2020), Yildiz et al. (2020), Yang and Lee (2020), Sharma and Sharma (2020), Rompho (2020), Montequin et al. (2020), Lin and Cheng (2020), Kober and Northcott (2020), Gao and Gurd (2020), Dudic et al. (2020), Benkova et al. (2020), de Sousa et al. (2020), and Boskovic and Krstic (2020) investigated mainly the following topics in 2020: (1) synergy

Table 2 Most Dedicated Publishers to the BSC Research (Number of Publications above 5 is Reported)

Title of the Source (Publishers)	No. of Publications
Expert Systems with Applications (ABS or AJG Index)	15
Total Quality Management Business Excellence (SSCI List)	15
Korean Accounting Journal	10
Sustainability (SSCI List)	10
International Journal of Productivity and Performance Management (ABS or AJG Index)	9
Procedia Social and Behavioral Sciences	9
Accounting Review (SSCI List)	8
Advances in Social Science Education and Humanities Research	8
Actual Problems of Economics (ABS or AJG Index)	7
Advanced Science Letters	7
Betriebswirtschaftliche Forschung und Praxis (SSCI List)	7
Harvard Business Review (SSCI List)	7
IOP Conference Series Materials Science and Engineering	7
Journal of Cleaner Production (ABS or AJG Index)	7
Korean Academic Society of Accounting	7
Service Industries Journal (SSCI List)	7
Wiley Publishers (Book and Book Chapter)	7
Accounting Organizations and Society (SSCI List)	6
AEBMR Advances in Economics Business and Management Research	6
Industrial Management Data Systems	6
International Journal of Health Planning and Management (SSCI List)	6
International Journal of Hospitality Management (SSCI List)	6
Journal of Health Care Finance	6
Journal of the Operational Research Society (SSCI List)	6
Long Range Planning (SSCI List)	6
The International Journal of Health Planning and Management (SSCI List)	6

Source: Prepared by the Author (Based on the Web of Science Database)

Table 3 Major Research Areas of the BSC Research

Major Research Areas	No. of Publications	% in Total
Business and Economics	646	56
Computer Science and Engineering	203	18
Health Science	161	14
Social Science, other	143	12
Total	1,153	100

Source: Prepared by the Author (Based on the Web of Science Database)

between ANP and BSC; (2) BSC implementation in sport and marine sectors, higher education institutions, financial software factory, small and medium enterprises (SMEs), banks, government agencies, and private companies; (3) innovation and BSC; (4) BSC for the development of educational programs; (5) fraud risk and integrated BSC-based decision model; (6) cause and effect relationships and performance evaluation; (7) supply chain and BSC; (8) fuzzy AHP-based BSC, and (9) Bradley–Terry model-based BSC. These recent studies in 2020 prove that there is a still high demand for BSC research, and the focus is shifting from management and accounting topics to social sciences and computer science topics, e.g., information technology, artificial intelligence, decision making, innovation, and risk. Besides, the research gap concerning BSC in economics—social and political perspective—still exists as of today.

Table 4 Themes Studied in the BSC Research

Themes Studied	No. of Publications	Percentage
Performance Measurement and Indicators	338	29
Adoption, Implementation, Application (Case Studies)	240	21
Linking to Strategy & Strategic Planning	206	18
Fuzzy, ERP, ANP, Artificial Intelligence, Information Systems, DEMATEL, Decision Making	76	7
Balance Scorecard (General-Descriptive and Conceptual)	74	6
SBSC and Green BSC	70	6
Cause-Effect Link	55	5
Framework/Architecture	46	4
Supply Chain	26	2
Employee and Management Dimension	22	2
Total	1,153	100

Source: Prepared by the Author (Based on the Data in the Web of Science Database)

The evolution, frequency distribution, citation analysis, and influential scholars are discussed for the SBSC. The evolution of the scientific production by years (from 2001 to 2020) in the Web of Science database and Google Scholar is illustrated in Figure 3, which holds a clue to the scholars about the demand in the SBSC field. Figure 3 starts with the year of 2001 because the SBSC has entered the literature by Epstein and Wisner (2001).

To provide a broader and holistic perspective for the SBSC research, Google Scholar has included a bibliometric analysis in addition to the Web of Science database. From 2001 to 2020, there was only 70 SBSC research reported in the Web of Science database. On the contrary, Google Scholar has reported a holistic picture with 203 publications, which also includes these 70 publications from the Web of Science. Figure 3 shows the distribution of publications in the area of SBSC by year. The most prolific years were 2001, 2011, and 2018 with 16, 20, and 18 publications, respectively. The reasonable amount of manuscripts, on average 10 manuscripts per year, has been published between 2001 and 2020. Ninety-one percent of these publications were in English.

Table 6 reveals the top 10 *most cited* studies and influential scholars in the field of SBSC. Figge et al. (2002a) are one of the doyens of the SBSC research, and their article has been cited 1,348 times. Other influential scholars are Epstein and Wisner (2001) because they initiated research on a BSC for sustainability. The majority of the publications in SBSC was about how to link the sustainability to business strategy, how to evaluate the sustainable performance of the organizations through the BSC approach, and how to use BSC for eco-efficiency analysis (Dias-Sardinha & Reijnders, 2005; Dias-Sardinha et al., 2002; Möller & Schaltegger, 2005). Furthermore, the publication of Hansen and Schaltegger (2016) was about the architecture of the SBSC. They have discussed the frameworks of SBSC and future research agenda on the architecture of the SBSC. Even though not disclosed in Table 6, Nikolaou and Tsalis (2013) and Butler et al. (2011) published noteworthy articles on integrating sustainability measures into BSC and the development of SBSC architecture. In the literature, there are three approaches for the SBSC architectures regardless of the sector of the firm. Approach 1 is integrating the sustainability concerns into the four standard perspectives; approach 2 is adding fifth sustainability or stakeholder perspective to the conventional BSC; and approach 3 is developing a separate BSC only relevant to environmental or social issues (Butler et al., 2011; Eklund & Kutuk, 2020; Epstein & Wisner, 2001; Figge et al., 2003; Journeault, 2017; Nikolaou & Tsalis, 2013). Scholars have not reached a consensus on the best architecture of SBSC. Each architecture has its own pros and cons. Due to the lack of universal and single “one-fits-all” approach, the companies should select the most suitable architecture of SBSC for their

Table 5 Recent (2015–2020) and Most Cited Studies in the BSC Field

Title	Author (Year)	Area of the Research
Balanced Scorecard-Based Analysis about European Energy Investment Policies: A Hybrid Hesitant Fuzzy Decision-Making Approach with Quality Function Deployment	Dincer et al. (2019)	Computer science-fuzzy-based BSC
An Integrated Method to Plan, Structure and Validate a Business Strategy using Fuzzy DEMATEL and the Balanced Scorecard	Acuna-Carvajal et al. (2019)	Computer science-fuzzy and DEMATEL-based BSC
Balanced Scorecard Based Performance Measurement of European Airlines using a Hybrid Multicriteria Decision Making Approach under the Fuzzy Environment	Dincer et al. (2017)	Computer science-fuzzy-based BSC
Popularizing a Management Accounting Idea: The Case of the Balanced Scorecard	Cooper et al. (2017)	Computer science-ANT, decision making, and BSC
Supplier Selection in Automobile Industry: A Mixed Balanced Scorecard-Fuzzy AHP Approach	Galankashi et al. (2016)	Computer science-fuzzy AHP-based BSC
A Study of Enterprise Resource Planning (ERP) System Performance Measurement using the Quantitative Balanced Scorecard Approach	Shen et al. (2016)	Computer science-ERP and BSC
Strategic Value of Cloud Computing in Healthcare Organizations using the Balanced Scorecard Approach: A Case Study from A Saudi Hospital	Alharbi et al. (2016)	Computer science-Cloud computing and BSC
Measuring Knowledge Management Performance in Organizations: An Integrative Framework of Balanced Scorecard and Fuzzy Evaluation	Lyu et al. (2016)	Computer science-fuzzy-based BSC
Service Performance Evaluation using Data Envelopment Analysis and Balance Scorecard Approach: An Application to Automotive Industry	Tan et al. (2017)	Economics-Data envelopment analysis and BSC
Balanced Scorecard in SMEs: Effects on Innovation and Financial Performance	Malagueno et al. (2018)	Business-innovation and BSC
Ideology and the Balanced Scorecard: An Empirical Exploration of the Tension Between Shareholder Value Maximization and Corporate Social Responsibility	Bento et al. (2017)	Business and social sciences-Stakeholder Value maximization, ethics, and BSC
TQM and Organizational Performance using the Balanced Scorecard Approach	Mehralian et al. (2017)	Business-TQM, and BSC
Strategy Map Concepts in a Balanced Scorecard Cockpit Improve Performance	Hu et al. (2017)	Business-Strategy management, corporate performance, and BSC
Toward a Dynamic Balanced Scorecard Model for Humanitarian Relief Organizations' Performance Management	Anjomshoe et al. (2017)	Business and social Sciences-Decision making, ethics, and BSC
Quality Measures for Dialysis: Time for a Balanced Scorecard	Kliger (2016)	Business-HRM (merit-based incentive payment system) and BSC
Dynamic Decision Making Using the Balanced Scorecard Framework	Humphreys et al. (2016)	Business-Decision making and BSC
The Role of Visual Attention in the Managerial Judgment of Balanced-Scorecard Performance Evaluation: Insights from Using an Eye-Tracking Device	Chen et al. (2016)	Business-Decision making (visual attention) and BSC

Source: Prepared by the Author (Based on the Data in the Web of Science Database)

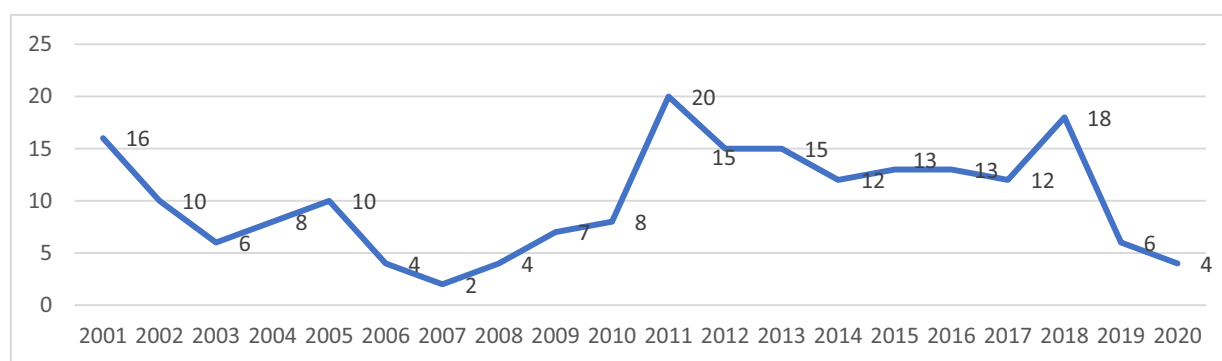


Figure 3 Publication Trend by Year for Studies on SBSC (2020 is until by March) Source: Prepared by the Author (Based on the Data in the Web of Science Database and Google Scholar)

Table 6 Top 10, Most Cited Publications in the SBSC Literature

Title	Author (Year)	Source	Number of Cites
The Sustainability Balanced Scorecard: Linking Sustainability Management to Business Strategy	Figge et al. (2002a)	Business, Strategy, and the Environment	1,348
Using a Balanced Scorecard to Implement Sustainability	Epstein and Wisner (2001)	Environmental Quality Management	366
The Sustainability Balanced Scorecard as a Framework for Eco-Efficiency Analysis	Möller and Schaltegger (2005)	Journal of Industrial Ecology	268
The Sustainability Balanced Scorecard as a Framework for Selecting Socially Responsible Investment: An Effective MCDM model	Tsai et al. (2009)	Journal of the Operational Research Society	170
The Sustainability Balanced Scorecard: A Systematic Review of Architectures	Hansen and Schaltegger (2016)	Journal of Business Ethics	162
Evaluating Environmental and Social Performance of Large Portuguese companies: A Balanced Scorecard Approach	Dias-Sardinha and Reijnders (2005)	Business Strategy and the Environment	151
From Environmental Performance Evaluation to Eco-efficiency and Sustainability Balanced Scorecards	Dias-Sardinha et al. (2002)	Environmental Quality Management	134
The Sustainability Balanced Scorecard: Theory and Application of a Tool for Value-Based Sustainability Management	Figge et al. (2002b)	Greening of Industry Networks Studies	130
Towards a Sustainability Balanced Scorecard: Linking Environmental and Social Sustainability to Business Strategy	Dyllick (2001)	Proceeding at Proceedings der 10th Business Strategy and the Environment Conference	129
Green Supply Chain Performance Measurement using Fuzzy ANP-based Balanced Scorecard: A Collaborative Decision-Making Approach	Bhattacharya et al. (2014)	Production Planning & Control	115

Source: Prepared by the Author (Based on the Web of Science Database and Google Scholar)

organization, which serves the best for their objectives, strategies, corporate structure, and the sector. One of the emerging multi-disciplinary themes in SBSC is the green supply chain, the multiple criteria decision-making (MCDM) method, and the fuzzy ANP-based BSC (Bhattacharya et al., 2014; Tsai et al., 2009) and currently, in 2020, the scholars have intensely researched on these topics.

The most dedicated scientific journals to the SBSC research are listed in Table 7. Nine journals out of 12 are ranked in the SSCI, AJG (or ABS), or ABDC (Australian Business Deans Council) list. The most dedicated (ranked) journals to SBSC research are *Sustainability*, *Journal of Cleaner Production*, and *International Journal of Hospitality Management*, *Journal of Business Ethics*, *Management Accounting Quarterly*, *Accounting Education*, *Expert Systems with Applications*, *Journal of the Operational Research Society*, and *Issues in Social & Environmental Accounting*. This list (Table 7) guides the scholars through respected and dedicated journals to submit their scholarly research in SBSC.

Table 8 illustrates the overview of SBSC publications according to the major research areas. The majority of the prior research is in business and economics (65%) and environmental science (23%). The rest are in computer science and engineering (9%), social sciences (other than business and economics, 2%), and health science (1%). The SBSC research in health science, social sciences, e.g., sociology, psychology, and computer science is overlooked.

Table 9 exhibits the thematization of SBSC research. The majority of the prior research has focused on the general guidelines and concepts of SBSC (28%), linking the sustainability to business strategy, and evaluating the sustainable firm performance (20%). Even though 13% of the previous literature was about the adaptation and

Table 7 Most Dedicated Publishers to the SBSC Research (Number of Publications above 1 is Reported)

Journal Title	No. of Publication
Sustainability (SSCI index)	9
Journal of Cleaner Production (ABS or AJG index)	5
International Journal of Hospitality Management (SSCI index)	5
Journal of Business Ethics (SSCI index)	3
Management Accounting Quarterly (ABS or AJG index)	2
Controlling	2
Accounting Education (ABS or AJG index)	2
Expert Systems with Applications (ABS or AJG index)	2
Environmental Quality Management	2
Journal of the Operational Research Society (SSCI index)	2
Issues in Social & Environmental Accounting (ABDC list)	2
Environmental Economics	2

Source: Prepared by the Author (Based on the Data in the Web of Science Database and Google Scholar)

Table 8 Major Research Areas of the SBSC Research

Major Research Areas	No. of Publications	% in Total
Business and Economics	131	65
Environmental Science	46	23
Computer Science and Engineering	18	9
Social Science, other	5	2
Health Science	3	1
Total	203	100

Source: Prepared by the Author (Based on the Data in the Web of Science Database and Google Scholar)

Table 9 Themes Studied in the SBSC Research

Themes Studied	No. of Publications	Percentage
SBSC (General-Guidelines, Descriptive and Conceptual)	57	28
Sustainable Firm Performance, Performance Evaluation	40	20
Adoption, Implementation, Application (Case Studies)	26	13
Corporate Strategy, Strategy Management	22	11
Framework and Architecture	21	10
Fuzzy-based, Analytic Hierarchy Process (AHP), and MCDM Model, Decision Making and Information Technologies	17	8
Supply Chain	12	6
Sustainable Indicators and Eco-Efficiency	5	2
Corporate Governance and Managerial Performance	3	1
Total	203	100

Source: Prepared by the Author (Based on the Data in the Web of Science Database and Google Scholar)

application (case studies) of SBSC in various sectors, there are still some environmentally malignant sectors that have not been investigated from the perspective of implementation of SBSC. These sectors are discussed in the future research agenda section below. Another two themes studied by the scholars are the corporate strategy management through BSC utilization (11%) and the architecture of the SBSC (10%). The thematic analysis of the SBSC papers indicated that SBSC or green BSC relation with sustainable indicators and eco-efficiency, sustainable supply-chain, computational intelligence, information management, corporate governance, and managerial performance have been scarcely researched so far. For instance, as Onder and Baimurzin (2020) and Anazonwu et al. (2018) reported, organizations' corporate governance structures have a significant impact on their sustainability performance and reporting. Thus, SBSC is a useful tool for corporate governance, human capital management, and executive compensation.

The most cited recent studies on SBSC research between 2015 and 2020 are listed based on the areas of research and year in Table 10. As noted below, decision making (MCDM), ANP, and fuzzy-based SBSC are popular topics in computer science. On the contrary, in the business discipline, the most cited articles between 2015 and 2020 are in the areas of reverse logistics, sustainable supply chain, the architecture of SBSC, and implementation of SBSC in different sectors, such as higher education, SMEs, and family-owned hotels.

In addition to the most cited article (2015–2020) in Table 10, the publications on SBSC in 2019 and 2020 are in the following areas: (1) sustainability value creation, SBSC, and resilient and sustainable growth; (2) implementation of SBSC in Cancun City; (3) sentiment mining techniques in SBSC and sustainability reports and corporate financial ratios; (4) SBSC and its implementation to the aluminum industry; (5) framework for dynamic SBSC in the turbulent environment; (6) risk-based SBSC; and (7) SBSC and firm market performance (Cador et al., 2019; Cokins & Capusneanu, 2020; Hristov et al., 2019; Na et al., 2020; Odum & Odum, 2019; Zandieh et al., 2020).

If the current literature on (S)BSC is critically evaluated, it is evident that most of the scholars have intensely focused on the business discipline, including the topics of performance measurement indicators, sustainable performance, strategy management, SBSC architecture, and application of (S)BSC into environmentally malignant sectors.

Moreover, from the methodological point of view, the majority of the articles are conceptual without any qualitative or quantitative methodology. Even though theory-driven empirical studies are very scarce, some studies have utilized surveys and interviews. Specifically for the SBSC literature, Hansen and Schaltegger (2016)

Table 10 The Recent (2015–2020) and Most Cited Studies in the SBSC Field

Title	Author (Year)	Area of the Research
Sustainable Technology Selection Decision-Making Model for Enterprise in Supply Chain: Based on a Modified Strategic Balanced Scorecard	Xia et al. (2017)	Business-Sustainable supply chain
The Sustainability Balanced Scorecard: A Systematic Review of Architectures	Hansen and Schaltegger (2016)	Business-Structure of SBSC
The Fifth Pillar of the Balanced Scorecard: Sustainability	Kalender and Vayvay (2016)	Business-Structure of SBSC
An Empirical Investigation on the Links within a Sustainability Balanced Scorecard (SBSC) Framework and their Impact on Financial Performance	Sands et al. (2016)	Business-Structure of SBSC
Outsourcing Decisions in Reverse Logistics: Sustainable Balanced Scorecard and Graph Theoretic Approach	Agrawal et al. (2016)	Business-Sustainable supply chain
An Environmental Balanced Scorecard for Supply Chain Performance Measurement	Ferreira et al. (2016)	Business-Sustainable supply chain
Sustainable Development in Technological and Vocational Higher Education: Balanced Scorecard Measures with Uncertainty	Lin et al. (2016)	Business-Case study on SBSC
Sustainability Management with the Sustainability Balanced Scorecard in SMEs: Findings from an Austrian Case Study	Falle et al. (2016)	Business-Case study on SBSC
Development of a Sustainable Competitive Advantage Model Based on Balanced Scorecard	Hakkak and Ghodsi (2015)	Business-Structure of SBSC
Corporate Social Responsibility and Sustainability Balanced Scorecard: The Case Study of Family-Owned Hotels	Kang et al. (2015)	Business-Case study on SBSC
Fuzzy-Based Sustainability Evaluation Method for Manufacturing SMEs using Balanced Scorecard Framework	Singh et al. (2018)	Computer Science-Fuzzy-based SBSC
A Hybrid MCDM and Sustainability-Balanced Scorecard Model to Establish Sustainable Performance Evaluation for International Airports	Lu et al. (2018)	Computer Science-MCDM, BSC, and decision making
The Concept of Maintenance Sustainability Performance Assessment by Integrating Balanced Scorecard with Non-Additive Fuzzy Integral	Jasiulewicz-Kaczmarek and Zywicka (2018)	Computer Science-Fuzzy-based SBSC
Sustainability Evaluation Model for Manufacturing Systems Based on the Correlation between Triple Bottom Line Dimensions and Balanced Scorecard Perspectives	Nicoletti Junior et al. (2018)	Computer Science-Manufacturing systems and SBSC
Integrating Environmental and Social Sustainability into Performance Evaluation: A Balanced Scorecard-Based Grey-DANP Approach for the Food Industry	Duman et al. (2018)	Computer Science-DANP-based SBSC
Sustainability Performance Measurement with Analytic Network Process and Balanced Scorecard: Cuban Practical Case	Medel-González et al. (2016)	Computer Science-ANP-based SBSC
Evaluating the Performance of Thermal Power Enterprises using Sustainability Balanced Scorecard, Fuzzy Delphic and Hybrid Multi-Criteria Decision-Making Approaches for Sustainability	Zhao and Li (2015)	Computer Science-Fuzzy-based SBSC and decision making

Source: Prepared by the Author (Based on the Data in the Web of Science Database and Google Scholar)

stated that only 13 and 2% of the studies have used surveys and interviews, respectively, and 35% is only conceptual and descriptive without theory and methodology. It means that theory-driven empirical research lacks in this field.

There was no dominant or mostly applied theory in BSC research. Scholars referred to theories in various disciplines, but mainly in the areas of economics, business, and psychology. For instance, agency theory, stakeholder theory, institutional theory, organizational behavior theory, economic theory, grounded theory, contingency theory, game theory, actor network theory, resource dependence theory, technical rational choice theory, and psychology theories (social and cognitive psychology) were the examples from the previous literature (Barter & Bebbington, 2013; Hoque, 2014; Leksono et al., 2019; Stas et al., 2015). On the contrary, the dominant theories discussed in SBSC research were as follows: environmental and ecological theories, especially in the business and ethics field. For example, contingency theory, legitimacy theory, institutional theory, stakeholder theory, and positive agency theory were the five dominant theories in the prior SBSC literature (Bouma & Veen, 2004; Hansen & Schaltegger, 2016; Jensen, 2002; Johnsen, 2001; Nankervis & Compton, 2006; Nikolaou & Tsalis, 2013).

For the evaluation of the case studies in SBSC literature, it is noted that SBSC has been applied to the following sectors: oil and gas sector and oil-producing companies, semi-conductor, furniture, chemical, pharmaceutical, fishing, manufacturing, finance industries, service sectors, such as hotels, hospital, universities, etc., wineries, SMEs, local public enterprises, and state-owned enterprises. On the contrary, as further conceptual research, academics can develop sustainable BSC architecture or case studies for the sectors that have not been analyzed yet and that are under the scrutiny of environmentalists, such as mining, technology hardware and telecommunication, food, beverages, and tobacco, automobiles, transportation, personal products, and packaging. Moreover, it is also noted that there is still no consensus on the “best architecture” for SBSC although three different approaches were discussed in the literature. In other words, there is still a lack of standard instructions on how to integrate sustainability concerns into the BSC perspectives. As a further study, as also addressed by Nikolaou and Tsalis (2013), the limited number of studies has provided standard procedures to select sustainability KPIs, so the researchers may investigate this subject further and come up with some generally accepted sustainability KPIs for each perspective of SBSC. Post COVID-19, the topics of dynamic, resilient, and agile framework for SBSC, SBSC in turbulent times, risk-based SBSC, and HCM-based BSC are the other promising research themes.

After the critical evaluation, Figure 4 graphically presents the research gaps with emerging themes and relevant theories on (S)BSC to guide the scholars to multi-disciplinary, multi-cultural, and theory-driven future research avenues. Figure 4 (future research framework matrix) is developed by the author with the help of the bibliometric analysis and integrative review, and it serves as a tool to help scholars to develop new theoretical models for future prospects in (S)BSC.

Figure 4 reveals multi-disciplinary overlooked research paths on the topic. For instance, in the area of social sciences, the ethical and normative perspective of SBSC, the cultural and sociological impacts on SBSC, internal actors, psychological and behavioral aspects of SBSC can be investigated from the assumptions of normative theory, business ethics and virtue ethics theory, accountability, legitimacy, socio-cultural, and psychology theories, respectively. Moreover, the economic and socio-political aspects of SBSC, such as the implementation of SBSC in the public sector and its impact on public sector reforms and economy in developing and developed countries, can be researched further in line with economic and socio-political theories. In the discipline of business and management, theory-driven and mixed-method studies can be performed in the areas of institutional entrepreneurship, corporate governance structures, executive compensation, management and employee motivation and synergy, community-driven success, organizational culture, and value creation for

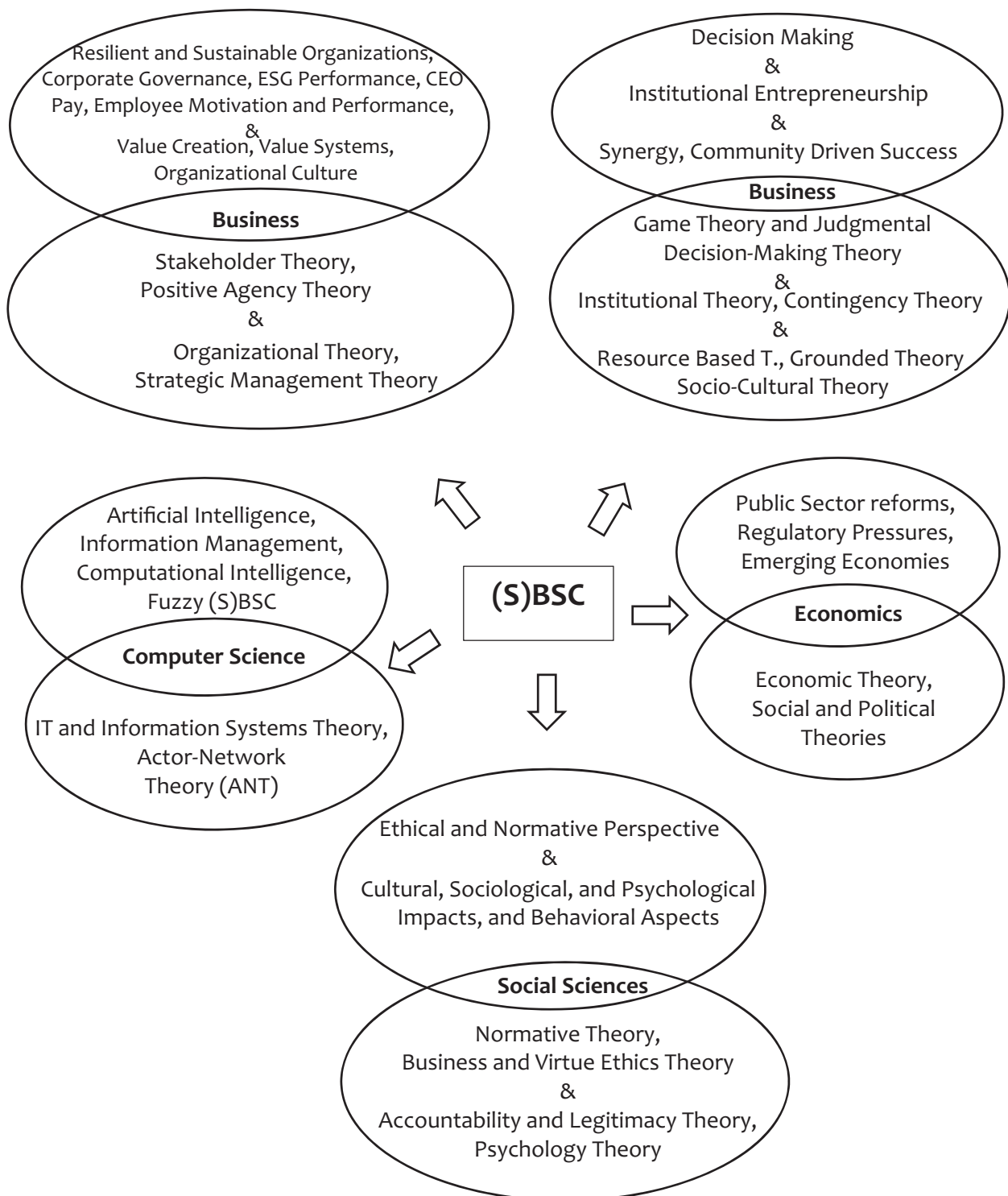


Figure 4 Future Research Framework Matrix on (S)BSC: A Graphical Presentation Source: Developed by the Author

stakeholders. The relevant theories for the aforementioned themes in the business and management field could be institutional theory, contingency, resource-based, grounded, stakeholder, positive agency, organizational, instrumental, and strategic management theories. Finally, last but not least, the multi-disciplinary studies in business and computer science, such as SBSC and decision making (game theory and judgmental

decision-making theory), SBSC and artificial intelligence, information management, computational intelligence, etc. (IT and information system theories and actor-network theory), etc., could be interesting future research areas.

CONCLUSION

SBSC is a relatively contemporary topic and a new tool of management accounting, compared to the BSC, and it can be debated further due to the existing gap in the literature. This paper answered the research question of “what are the future prospects in the balanced scorecard research from the perspective of sustainability” by critically analyzing the content of the (S)BSC literature, recognizing the emerging themes and research gaps, and, finally, recommending future research directions through the developed framework matrix.

The future prospects in BSC research from the sustainability perspective were discussed based on the bibliometric analysis and integrative review in the previous sections. In summary, it is noted that there is a gap for multi-disciplinary, multi-dimensional, and multi-cultural empirical research on SBSC, which will advance the knowledge in the field and be appreciated by the respected publishers. For the further empirical quantitative and qualitative research, the following research questions are suggested: “how the architecture of the SBSC revised to reach sustainable, resilient, and agile businesses”; “how the SBSC utilization impacts the corporate financial performance”; “whether SBSC has any effect on the sustainable growth or the corporate Environmental Social and Governance (ESG) performance or the Social and Environmental (CSR) performance”; “what is the stakeholders’ perception on the utilization of SBSC”; and “how the SBSC utilization impacts the corporate governance structure of the organizations or the CEO’s variable compensation.”

This paper has practical and academic implications because it provides the readers with a holistic picture and theoretical background of BSC and SBSC research and exhaustive analysis of current literature and it motivates the local governments and businesses to use more environmentally benign systems and tools. It is also noted that in 2020, the publishers are from more diverse disciplines, and more publishers have interest in publishing (S)BSC research. (S)BSC is not anymore the topic of only accounting and management domain; it is an interdisciplinary topic. The limitation of this study is that it is a conceptual study, so it does not test any hypotheses through statistical methods. However, with the proposed future research questions, it opens door to empirical and mixed-method studies.

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