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THE PAST AND FUTURE OF CORPORATE SUSTAINABILITY RESEARCH

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ABSTRACT

Despite the skyrocketing of sustainability-related research in the strategy and management fields, there has been no comprehensive systematic review of the field as a whole. In this paper, we present a comprehensive review of the field of corporate sustainability using a science mapping co-word bibliometric analysis. Through analysis of the co-occurrence of 25,701 keywords in 11,962 sustainability-related articles from 1994-2021, we identify and graphically illustrate the thematic and theoretical evolution of the field, in addition to emerging and waning research trends in the field. We characterize the most impactful articles of sustainability research in terms of disciplinary focus, topic of focus, dependent variable of focus, unit of analysis, and research method employed. We describe implications for the field and identify opportunities for future research.

Keywords: corporate sustainability, systematic review, research impact, science mapping, bibliographic analysis

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INTRODUCTION

Corporations are increasingly engaging in corporate-sustainability-related practices and claiming commitment to such issues as the betterment of society, protecting the environment, and engaging in fair and transparent governance practices (Flammer et al., 2019; Meuer et al., 2020). The topic of corporate sustainability—“the inclusion of social and environmental concerns in business operations and in interactions with stakeholders and . . . meeting the needs of a firm's direct and indirect stakeholders [...] without compromising its ability to meet the needs of future stakeholders” (Dyllick & Hockerts, 2002, p. 131), has thus become an increasingly prevalent focus in academic research.

Researchers during the last twenty years have published about twelve thousand articles on corporate sustainability issues, with the number accelerating during the last ten years. Scholars have reviewed the definitions of corporate social responsibility (Carroll, 1999; Dahlsrud, 2008; Meuer et al., 2020), sustainable development (Mebratu, 1998), the triple bottom line (Alhaddi, 2015), sustainability-oriented innovation (Adams et al., 2016), the definition and measurement of corporate sustainability (Barnett, et al., 2020; Montiel & Delgado-Ceballos, 2014), theories of corporate social responsibility (CSR) (Garriga & Melé, 2008), the relationship between environmental management research and other research areas (Etzion, 2007; Bansal & Hoffman, 2012), and the relationship between CSR predictors and outcomes (Aguinis & Glavas, 2012), such as corporate sustainability disclosure or certification (Jellema et al., 2022; Gray et al., 1995). Some have used meta-analyses to examine the relationship between CSR and firm performance (Carroll & Shabana, 2010; de Bakker et al., 2005; Margolis & Elfenbein, 2009; Margolis & Walsh, 2001; Orlitzky et al., 2016; Salzmann et al., 2005; Taneja et al., 2011; van Beurden & Gössling, 2008), with mixed results (see Margolis et al., 2009; Margolis & Walsh, 2001). Researchers have also conducted bibliometric analyses in the subtopical

areas of business and the environment (Hoffman & Georg, 2012); corporate responsibility (Barnett et al., 2020; Brammer et al., 2022), climate change and engineering (Belter & Seidel, 2013; Nyberg et al., 2022), green supply chain management (Fahimnia et al., 2015), energy efficiency (Du et al., 2012), sustainable development (Quental & Lourenco, 2011); sustainability science (Kaikawa et al., 2014), and social entrepreneurship (Vedula et al., 2021).

While these reviews provide important insights into various facets of corporate sustainability, they offer a limited view of corporate sustainability research as a whole, which has constrained extant reviews' ability to identify the relative importance of and connections between the various components of corporate sustainability research. Furthermore, reviews and analyses focused on a particular subfield of sustainability have assumed—rather than objectively observed—the relative importance of that subfield to the field of sustainability as a whole. The result is a need to conduct a comprehensive review of the field of corporate sustainability, to identify the evolution of the field as a whole, and to objectively identify the relative importance of and connections between the various facets of sustainability research. A comprehensive review facilitates identifying the field's research trends and gaps and enabling the identification of possible promising directions for future sustainability research.

In this article, we conduct such a review by applying science mapping, a methodology that researchers increasingly value for comprehensively examining a field of study (Moral-Muñoz et al. 2019). By analyzing the co-occurrence of 25,701 keywords in 11,962 sustainability-related articles from 1994 to 2021, science mapping enabled identifying, graphically illustrating, and quantitatively analyzing the emergence and evolution of the main concepts of the sustainability field over time and the relationships between them. We further examine the evolution of the most impactful articles in the

field, in terms of the various choices researchers face, namely, theoretical and disciplinary lenses, sustainability facets of focus, dependent variables, methodologies, and units of analysis.

Our analysis of almost three decades of corporate-sustainability research demonstrates that the field has moved from a focus on environmental issues to including social and governance issues. It has developed from the disciplines of economics and strategy to incorporate research from different areas of business scholarship, such as operations, marketing, human resources, and accounting. Throughout the period we analyze, corporate-sustainability research methods have predominantly used quantitative analysis of secondary data at the firm level, with a focus on large firms. However, more recently, we see the emergence of smaller firms and supply chains as units of analysis. We also observe a co-evolution of two main theoretical lenses over time: the resource-based view and stakeholder approaches. Furthermore, the emergence of new theoretical lenses is beginning to emphasize sustainable strategy from the perspectives of innovation, entrepreneurship, and governance. While much research has adopted an instrumental view of sustainability, linking the pursuit of sustainability to profit maximization, a very recent increase has occurred in research examining sustainability impact as the focal dependent variable.

Our examination of the sustainability field evolving along these various dimensions enables us to identify both theoretical and practical gaps in our understanding of corporate sustainability and the role that firms play in improving or worsening the environment and society. At a high level, we argue for pushing further, beyond the “business case,” to better understand the mechanisms that link sustainable practices to societal benefits and, thus, develop effective theories of change. We suggest that a better understanding of both the mechanisms that drive the organization’s environmental and social practices and their impacts on the firm and society can (1) support a more robust theoretical understanding of the

antecedents and consequences of sustainability practices, and (2) facilitate the development of effective, sustainable, and practical solutions that successfully diffuse throughout and across organizations. We contend that the instrumental view of sustainability—the predominant view for the last two decades—limits research from a theoretical perspective and is also problematic from a practical perspective. It leads companies to focus on a small set of “easy wins” that fail to address major environmental problems and confront trade-offs between profits and the planet or society. To better understand the impacts of sustainability practices in totality, researchers must continue to complement studies examining the effects of such practices on firm financial-performance outcomes, by examining the effects of such practices on the planet and society. Accordingly, researchers must simultaneously develop better measures of practices and impacts and collect their own data without relying on third-party providers.

Beyond better understanding and measuring impact, an opportunity exists to develop robust theories of organizational change that show how organizations can facilitate rather than hamper positive change regarding climate and other sustainability-oriented objectives. Substantive theories of organizational change must likely move beyond a firm-level focus and take account of both individual and system-level incentives. Examining individual behavioral motivations within organizations forms more complex understandings of the mechanisms through which organizations adopt and implement sustainable practices, informing the adoption in practice of realistic solutions. At the same time, considering the aggregate role of corporations at the industry or country level is critical. Likewise, examining the effects on society and the environment of various sustainability practices and initiatives requires understanding how government interacts with industries, firms, and individuals. Therefore, we must better comprehend the interactions among individuals, firms, and society. This points to an

opportunity for future research to employ multilevel approaches that explicitly incorporate the role of individuals in addition to systems-level and more macro inputs and outcomes.

Impactful sustainability research must also adopt different methodologies. We found that researchers rarely collect their own data or collaborate with managers to produce research. This limits both the internal and external potential generalizability as well as the practical applicability of research in the field. The limited use to date of field experiments and knowledge co-creation events in collaboration with firms represents an important opportunity for future research. Moreover, within academia, the various disciplines focused on sustainability research have mostly remained siloed. We point to the potential for innovative research to emerge from management researchers collaborating across disciplines in both the social sciences and the natural sciences.

In what follows, we first use a science-mapping methodology to characterize the evolution of the field of sustainability over time. Then, we examine the evolution of the most impactful articles in the field, in terms of the various choices researchers face: theoretical and disciplinary approaches, facets of a sustainability focus, primary dependent variables, and decisions regarding methodology and unit of analysis. We conclude by discussing how trends in these research elements should continue or change, to maximize the relevance and impact of future sustainability research.

METHODOLOGY

Science mapping, also known as bibliometric mapping, “monitor[s] a scientific field and delimit[s] research areas to determine [a field’s] cognitive structure and its evolution” (Cobo et al., 2012, p. 1609). We perform a science-mapping analysis using an open-source science-mapping software tool called the Science Mapping Analysis Software Tool (*SciMAT*) that allows users to analyze and track the

conceptual evolution of a research field through consecutive time periods (Cobo et al., 2011, 2012).

The steps to implement this methodology involve (1) determining keywords of focus, (2) data acquisition and preprocessing, (3) detection of themes (clusters) and research impact analysis, and (4) visualization and categorization of themes. Due to space constraints, Appendix 1 describes our implementation of each step.

ANALYSIS OF THEMES IN STRATEGIC DIAGRAMS

We conduct our analysis of corporate sustainability-related articles by dividing the whole corpus into five consecutive time periods: 1994–2003, 2004–2008, 2009–2013, 2014–2017, and 2018–2021 (see Figure 1 for a depiction of the periods, and Appendix 1 Step 3 for the rationale). Our study represents 115 journals over time, or 57, 78, 107, 113, and 111 journals per period, respectively. Our study identifies 25,701 keywords, employing 2,681, 3,531, 7,912, 9,578, and 14,482 per period.

Appendix 2 reflects the evolution of research themes over time, depicting the strategic diagrams of themes in each period. Appendix 1 Step 2 provides an overview of the interpretation of the strategic diagram's quadrants (i.e., motor themes, basic and transversal themes, emerging/declining themes, and specialized/isolated themes). The keywords are grouped into 104 themes across all four quadrants, 17, 18, 22, 26, and 21 per period, respectively.

Here, we focus on motor themes, to characterize first the evolution of the field in terms of its main sustainability-related subjects and concepts, then its theoretical (and, relatedly, disciplinary) base. We focus on motor themes because their strong centrality and density make them well-developed and important in the structure of the research field (Martinez-Aires et al., 2014). We also discuss subthemes: those that link to the themes on the strategic diagram but do not appear there. See Appendix

3 for an example of a subtheme cluster network for the motor theme *Sustainability* in period 2. Due to space constraints, we do not show each theme's subtheme cluster network by period (they are available from the authors upon request).

Insert Figure 1 About Here

Evolution of Main Sustainability-Related Research Themes

As the strategic diagrams per period in Appendix 2 reflect, we observe several terms that denote corporate sustainability in related research. These include *Sustainability*, *Corporate Social Responsibility* (CSR), *Corporate Social Performance* (CSP), and *Green*. *Sustainability* appears in the second period (2004–2008) as a motor theme. As motor themes take the name of the most central keyword, this reflects the importance of the keyword "sustainability" in the period (Martinez-Aires et al., 2014). Sustainable development generally refers to “economic development policies and approaches of governments and their interaction with the natural environment” (Landrum, 2017, p. 289). It is associated with the following subthemes (see Appendix 3): *Green*, *Social performance*, *Sustainable development*, *Exhaustible resources*, *Income*, *Innovation*, *Natural resources*, *Climate change*, *Corporate responsibility*, *Depletion*, and the *European corporate sustainability framework*. The last theme likely appears because the term *corporate sustainability* appeared in the EU-financed European Corporate Sustainability Framework, which an international consortium of academics and experts developed to guide companies in demonstrating responsible ways of doing business (Hardjono & de Klein, 2004). The theme of *Sustainability* is prominent in period 2, but in the other periods, it is a subtheme satellite that links to other more prominent motor themes. In the first period (1994–2003), *Sustainability* appears as the largest subtheme satellite linked to the *Economics* motor theme. In period

3 (2009–2013), *Sustainability* is the largest subtheme linked to both the motor theme *Consumers* and the motor theme *Green*. In periods 4 and 5 (2014–2017, 2018–2022), *Sustainability* is a satellite subtheme of the motor theme *CSR*. While *Sustainability* is associated with both environmental and social subthemes, the motor theme *Green* encompasses mostly environmental subthemes, such as environmental performance or the natural environment. Interestingly, the term “corporate sustainability” as such does not appear as a theme.

CSR, consisting of “actions that appear to further some social good, beyond the interests of the firm and that which is required by law” (McWilliams & Siegel, 2001, p. 117), is the largest motor theme in periods 1 (1994–2003), 4 (2014–2017), and 5 (2018–2021), including such subthemes as *Stakeholders*, *Socially Responsible*, and *Governance*. The theme *Ethics*, strongly associated with *CSR*, is a subtheme satellite of the *CSR* motor theme in periods 1, 4, and 5, and *CSR* is the largest subtheme satellite of the *Ethics* theme in period 2. Interestingly, *CSR* does not connect to any subtheme related to the natural environment.

CSP is another recurring motor theme; it appears in periods 2 and 4. *CSP* “emphasizes a company's responsibilities to multiple stakeholders, such as employees and the community at large, in addition to its traditional responsibilities to economic shareholders” (Turban & Greening, 1997, p. 658). The largest satellites of *CSP* are *Financial performance* and *Stakeholder theory* (period 2), and *Stakeholder management* and *Shareholder value* (period 4). Interestingly, *CSP* also does not link to environmentally related concepts.

In summary, the various terms for identifying corporate sustainability research (*CSR*, *CSP*, *Sustainability*, and *Green*) all strongly interconnect and include environmental, social, and economic dimensions, thus showing each concept's multidimensionality. At the same time, we see that terms like

Sustainability and *Green* tend to focus on issues that relate to the natural environment, while terms like *CSR* and *CSP* link mostly to social issues.

Separate themes represent *Corporate governance* issues as a basic or transversal theme in periods 1 and 2 and a motor theme in periods 3, 4, and 5. *Governance* includes subthemes such as *investors*, *shareholders*, *directors*, *gender diversity*, and *corruption*.

In terms of sustainability issues, we see that *Energy* and *Greenhouse gas emissions* are motor themes in period 1, and *Climate change* is a motor theme in period 5. Motor themes also comprise terms reflecting sustainable management practices, such as *Compliance* and *Socially responsible investment* (period 2), *Certification* (period 3), and *Environmental disclosures* (periods 4 and 5).

Regarding stakeholder focus, we observe that *Consumers* constitute a motor theme in periods 3, 4, and 5. *Employee* is also a motor theme in periods 3 and 5. *Shareholders*, *investors*, and *board members* are subthemes in the *Corporate Governance* motor theme in periods 3, 4, and 5.

Turning to theoretical bases, the topic of firm economic performance predominates in all periods, with its representative motor themes reflecting its high centrality and density for the field over time. *Economics* and *Organizational performance* are motor themes in period 1, *Socially responsible investment* is a motor theme in period 2, *Financial performance* is the largest motor theme in period 3, *Firm value* is a motor theme in period 4, and *Economic growth* is a motor theme in period 5.

From the perspective of specific theories, the maps illustrate that the dominant theory is the *Resource Based View* (RBV) (motor theme in periods 1, 3, and 4), with the *Dynamic capability approach* following in period 2. Another theoretical approach important to the field is stakeholder theory. Indeed, *Stakeholder* and *Stakeholder theory* (or *model*) are subtheme satellites of the *Corporate*

Social Responsibility motor theme in periods 1 and 5. *Stakeholder Theory* and *Stakeholder Management* are subtheme satellites of the *CSP* motor theme in periods 2 and 4, where *Stakeholder Management* appears again as a subtheme of the *CSP* motor theme. This reflects the linkage between stakeholder theory and the social aspects of sustainability in these periods. In period 3, *Stakeholder management* and *Stakeholder theory* are associated with the *Financial performance* motor theme, and *Stakeholders* links to the *Governance* theme in periods 2 and 3. Other theoretical lenses also emerge, including those relating to institutional theory, innovation, and social entrepreneurship. We detail the evolution of the main theoretical approaches below.

Evolution of the Sustainability Field’s Theoretical Bases and Concepts

In period 1, *Economics* is a motor theme. It includes terms relating to the economic systems and issues pertinent to material use and international and legal issues.¹ Some articles appearing in the *Economics* theme describe the market economic-system drawbacks in dealing with environmental issues. For example, they refer to the large ecological footprints associated with economic growth, and the disconnect between the market economy and nature’s economy, “which consists of the natural systems and resources that support the market” (Hart, 1997, p. 67). While these observations have previously led to calls for the development of more stringent regulations (Barrett, 1991), scholars in this period look within the market economy for solutions to the environmental problem (Porter & van der Linde, 1995a, 1995b; Florida, 1996). Most studies included in our dataset take a strategic management research perspective and emphasize how sustainable management approaches can affect firm

¹ The full list of terms in the *Economics* theme is: change, demographics, material, need, capital, growth, international, legal, long-term, sustainability, economic-system.

competitiveness (Aragon-Correa, 1998; Hart, 1995; Marcus & Geffen, 1998; Maxwell et al, 1997; Rugman & Verbeke, 1998; Russo & Fouts, 1997; Sharma & Vredenburg, 1998). For example, the proposed business solutions to environmental problems include reducing costs or seeking market advantages through environmental differentiation strategies (Hart, 1995; Reinhardt, 1998, 1999; Shrivastava, 1995; Stead & Stead, 1995).

The Resource-based view & Dynamic Capabilities

In terms of theoretical concepts, RBV refers to the theory of the firm's competitive strategies and performance as dependent on firm-specific organizational resources and capabilities (e.g., Barney, 1991; Wernerfelt, 1984). It appears in period 1 as a subtheme of the theme *Capabilities*, situated in the lower-left quadrant. This period coincides with the seminal work by Hart (1995) and Russo and Fouts (1997), who first apply the RBV theory of the firm to the domain of corporate environmental strategies, inspiring others to expand on this notion. For example, Christmann (2000), in one of the most-cited articles in the *Economics* motor theme, highlights that firms' capabilities for process innovation and implementation are complementary assets that chemical companies require to gain cost advantage (Christmann, 2000). In period 2, the *RBV* becomes a motor theme in our strategic diagram, reflecting the importance of this theoretical focus in the sustainability literature during this period. Articles using the RBV approach increasingly study the different external conditions that drive the adoption of environmental practices and competitive advantage (Aragon-Correa & Sharma, 2003).

To examine these external conditions, some authors apply an institutional-theory framework that emphasizes the institutional and normative context in which firms operate (Delmas & Toffel, 2008; Hoffman, 1999; Hoffman, 2001; Hoffman & Jennings, 2015). Indeed, *Institutional theory* appears as an emerging theme in period 3 (bottom left quadrant) and grows to become a motor theme in period 5.

This reflects a shift away from the sustainability field's disciplinary basis in economics and toward the inclusion of sociological considerations (Hoffman, 2001). A few studies examine the interplay between the RBV and institutional theory in shaping environmental practices. For example, Bansal (2005) finds that both RBV and institutional factors influence corporate sustainable development, while Delmas and Toffel (2008) argue that differences in practice adoption reflect not only different levels of institutional pressures but also differences in the influence of their functional departments.

In period 3, *RBV* is a subtheme associated with the *Financial performance* motor theme. During this period, researchers argue for the need to better understand the role of time in the development of environmental capabilities (Bansal, 2005; Chakrabarty & Wang, 2012; Russo, 2009). They suggest a more dynamic approach to the RBV that considers how resources evolve with changes in the external environment (Bansal & Roth, 2000). Researchers responding to this call start applying a dynamic-capabilities approach to help explain the adoption of environmental practices. *Dynamic capabilities*, referring to the firm's ability to integrate, build, and reconfigure internal and external competencies to address the rapidly changing environment (Teece et al., 1997), becomes a motor theme in period 3. For example, Russo (2009) draws on the dynamic-capabilities model to explore how environmental management process standards influence manufacturing facilities' ability to improve environmental performance by reducing toxic emissions.

In periods 4 and 5, *RBV* becomes central again as a motor theme. Examining the subthemes of RBV (not shown due to space constraints), we see the integration of the *RBV* with other conceptual approaches, such as the dynamic-capability approach, as well as systemic and social network theory (Priem & Swink, 2012; Occasio et al., 2018; Testa et al., 2018; Bocken & Geradts, 2020). Research on supply chain management also adopts the RBV as a theoretical base (Beske et al., 2014; Longoni et al.,

2018; Sarkis et al., 2011; Wolf, 2014). For example, the RBV theory in sustainable supply chain management elucidates how focusing on sustainability-based operations in the supply chain can result in gaining competitive advantage (Hunt & Davis, 2012). In terms of an environmental, social, and governance (ESG) focal topic area, *RBV* most commonly links to research themes relating to the environmental aspect of sustainability, as shown in the following subthemes of *RBV* in periods 4 and 5: *Natural environment, Environmental management, Environmental performance, and Environmental strategy*.

Stakeholder Theory

Freeman (1984) pioneered stakeholder theory, asserting that firms have relationships with many constituent groups and that the actions of the firm both affect and are affected by these stakeholders. The theory stresses the interconnected relationships between a business and its customers, suppliers, employees, investors, communities, and others who have a stake in the organization. It argues that a firm should create value for all stakeholders, not just shareholders (Goodpaster, 1991). Initially, scholars sought to gain a better understanding of stakeholders, their strategies, and claims, and they did not much emphasize the links to corporate performance (Steurer, 2006). Some explored the status and legitimacy of certain stakeholder groups (Phillips & Reichart, 2000; Starik, 1995) while others developed a typology of stakeholder groups based on characteristics of power, urgency, and legitimacy (Mitchell et al., 1997). In addition, some analyzed the resources and strategies stakeholders used to accomplish their aims, and how this affected their success in doing so (Freeman, 1999).

Subsequently, a more instrumental view of stakeholder management emerged, linking the stakeholder approach to competitive advantage (Jones, 1995; McWilliams & Siegel, 2001; Schaltegger et al., 2019). Firms that establish relationships with their stakeholders on the basis of mutual trust and

cooperation arguably have a competitive advantage over firms that do not (Jones, 1995). Over the years, stakeholder theory has developed into a diverse research tradition, addressing “the overall stakeholder relationship as a multifaceted, multi-objective, complex phenomenon” (Harrison & Freeman, 1999, p. 483; Garcia-Castro & Aguilera, 2015).

We observe a more recent application of the stakeholder approach to the natural environment (as opposed to the social) facet(s) of sustainability (Darnall et al., 2010; Delmas, 2001; Kolk & Pinske, 2007; Wolf, 2014; Freudenreigh et al., 2020), as well as articles that combine the RBV and the stakeholder approaches (Fowler & Hope, 2007; Litz, 1996). For example, Hart (1995) developed propositions that draw from both RBV and stakeholder literature, and others have integrated the stakeholder and institutional approaches (Delmas & Toffel, 2004; Doh & Gay, 2006).

Additional Theoretical Approaches

Less dominant conceptual approaches also appear in the maps. These include *Innovation* (a basic/transversal theme in periods 1, 3, and 4, which becomes a motor theme in period 5) and *Social entrepreneurship* (a specialized/isolated theme in period 3 and an emerging theme in period 5). The role of innovation in facilitating businesses' transition to sustainable practices has drawn substantial researcher interest. Those focusing on innovation contend that in a market system, sustainability innovation is a key driver for sustainable development (Porter & Van der Linde, 1995; Nidumolu et al., 2009). Such innovation is achievable through product or process technology, as well as through governance practices (King & Lenox, 2002; Xie et al., 2019), conceptualized as both incremental and efficiency-focused, as well as radical and systemic. Some researchers investigate which actors will most likely bring about sustainability innovation under different conditions (Pinkse & Kolk, 2010; Schaltegger & Wagner, 2011). The fact that *Entrepreneurship*, *Corporate entrepreneurship*, and *Social*

entrepreneurship are subthemes of the *Innovation* theme in periods 1, 3, and 4 reflects researchers' frequent identification of entrepreneurs as critical to this process.

Social entrepreneurship describes the “work of community, voluntary and public organizations, as well as private firms working for social rather than for-profit objectives” (Shaw & Carter, 2007, p. 419). Various streams in the literature, including social entrepreneurship, sustainable entrepreneurship, and (indirectly) institutional entrepreneurship, have addressed the relationship between entrepreneurship and sustainable development (Schaltegger & Wagner, 2011). The entrepreneurship literature often adopts an optimistic narrative wherein societal challenges present opportunities for entrepreneurs to innovate and engage in transformative thinking. In the extant literature, earlier research addressing sustainability and entrepreneurship dealt mostly with environmentally oriented entrepreneurship, often called "ecopreneurship" (Cohen, 2006; Hall et al., 2010; Russo, 2001; Schaltegger, 2002; York & Venkataraman, 2010). Research on the relationship between entrepreneurship and social problems has become more prominent in subsequent periods (Bacq & Eddleston, 2018; Mair et al., 2012; Stephan et al., 2016). Particularly related to social entrepreneurship is research on small and family firms, highlighting the link between the importance they give socioemotional wealth (Berrone et al., 2010) and their potential for embracing corporate sustainability practices (Le Breton-Miller & Miller, 2016).

Recent Concepts of Focus

To identify recent issues of focus, we examine the last two periods, in which the motor themes of *Climate Change*, *Economic Growth*, and *Environmental Disclosures* seem quite related to each other but less connected to the RBV and stakeholder approaches mentioned above. As their subthemes indicate, these themes tend to focus on issues relating to the measurement (Pindyck, 2019; Mikkelsen,

2021) and communication (Giannarakis et al., 2018) of specific sustainability practices, as well as firm resilience or adaptation to climate events (McKnight & Linnenluecke, 2016; Clement & Rivera, 2017). Important questions in this domain relate to how to measure sustainability performance (Talbot & Boiral, 2018), the drivers and value of public disclosure of sustainability practices (Lewis et al., 2014; Carlos & Lewis, 2018; Hawn & Ioannou, 2016; Pucheta-Martinez et al., 2020), and the determinants of firms' choices to engage in substantive, as opposed to merely symbolic practices, or "greenwashing" (Parguel et al., 2011; Du, 2015; Lyon and Montgomery, 2015; Tashman et al., 2019).

Summary of Motor Themes Analysis

In summary, the analysis of motor themes shows the coexistence of a variety of families of corporate sustainability research, with the waxing and waning of several terms that commonly denote (subfields of) corporate sustainability over time and reflecting the evolution of focus on the environmental and social dimensions of corporate sustainability research, and their relationship to economic considerations. We also observe a co-evolution of two main theoretical lenses, the RBV and stakeholder approaches, whose integration increases over time. Finally, we see the development of new theoretical lenses emphasizing sustainability innovation from a technological but also a governance perspective, such as with the development of more recent research on social and family enterprises. Therefore, corporate sustainability includes a rich array of conceptual approaches, as well as many previously identified definitions (Meuer et al., 2020). In terms of issues of focus, the last periods reflect a clearly emerging interest in climate change and corporate disclosures. Next, we turn to specific elements of these interconnections in the field in more detail.

EXAMINATION OF MOTOR THEMES' MOST-CITED ARTICLES

Our prior analysis enabled us to identify the main motor themes in the field. We next examine the 10 most-cited articles for each of the 35 motor themes (corresponding to the upper-right quadrant of the strategic diagrams) detected across all five periods, to characterize the articles which have had the greatest impact in the field and examine their evolution over time (see Appendix 5 for a full list of articles in this part of the analysis). We consider the evolution of (1) the disciplinary focus, (2) the ESG factors studied, (3) the dependent variables and unit of analysis, and (4) the primary methodology in the most impactful articles in the field.

Evolution of Disciplinary Focus

The top-cited articles across all motor themes appeared in 40 journals, most published in the *Journal of Business Ethics*, *Strategic Management Journal*, and *Journal of Management*, with 75, 38, and 31 of the 363 most-cited articles, respectively. The 40 journals represent eight field categories from Harzing's broadly accepted Journal Quality List: General & Strategy; Economics; Marketing; Innovation; Organization Studies/Behavior, Human Resource Management, Industrial Relations; International Business (OS/OB, HRM/IR); Entrepreneurship; Operations Research, Management Science, Production & Operations Management (OR, MS, POM). Eight are explicitly sustainability-focused; 32 are not.²

In terms of the general field categories, we observe a significant decrease in the share of most impactful motor theme articles published in the General & Strategy category over time, dropping from

² <https://harzing.com/resources/journal-quality-list> (2021 version)

60% to 22% between periods 1 and 5. This group consists of articles published in such journals as *Academy of Management Review*, *Harvard Business Review*, and *California Management Review*. Similarly, sustainability articles in Economics journals saw a decline from 24% in the first period to 1–5% in the last three periods (see Appendix 4). On the other hand, sustainability publications in other journal types grew, reflecting a growing interest in sustainability topics in different fields of study. In particular, the most impactful sustainability publications in the OS/OB, HRM/IR area increased notably, from only 2% in the first period to 33% in the last period. Likewise, for Innovation, we see a significant jump from 4% in the first period to 25% in the last period (see Appendix 4).

In addition to these general field categories, we observe that the share of articles published in sustainability-focused journals increased from 26% to 53% between periods 1 and 5 (see Figure 2).³ This reflects that more than half of highly cited sustainability articles are now published in sustainability-focused journals.

In summary, over the five periods, we see a decrease in articles published in the General & Strategy and Economics categories and an increase in the share of publications in journals that represent other areas of management, as well as in sustainability-specific journals.

Insert Figure 2 About Here

³ The list includes the following eight journals: *Journal of Environmental Economics and Management*, *Journal of Business Ethics*, *Business Ethics: A European Review*, *Corporate Governance: An International Review*, *Business Strategy and The Environment*, *Corporate Social Responsibility and Environmental Management*, *Business Ethics Quarterly*, and *Business & Society*.

Evolution of Relative Focus of E, S, and G in “ESG”

The construct of corporate sustainability includes environmental, social, and governance (ESG) facets (Dyllick & Hockerts, 2002; Van Marrewijk, 2003). We categorize the top-cited articles in the motor themes as pertaining to environment, social, and/or government factors, to examine the evolution of these three facets of sustainability over time. Figure 3 reflects that more than half (55%) of the 50 journal articles examined in period 1 focus on the environmental facet of ESG, with articles focused on the social and government factors trailing with 18% and 27%, respectively. This is consistent with our earlier analysis of the thematic maps, and it supports scholars' observation of an environmental emphasis in early sustainability research (Van Marrewijk, 2003). For example, the article by Russo and Fouts (1995), one of the top-cited articles under the themes *Organizational Performance* and *CSR*, analyzes over 200 firms to show a positive relationship between environmental performance and economic performance. In periods 2 and 3, the social facet dominates, with 58% and 51%, respectively, of the top-cited articles reviewed, ahead of environment (13% and 24%) and governance (29% and 24%). McMichael et al. (2003) define sustainability with a social component, as the ability to transform “our ways of living to maximize the chances that environmental and social conditions will indefinitely support human security, well-being, and health” (McMichael et al. 2003, p. 1919).

We also observe articles that examine more than one ESG facet, such as those by Scherer and Palazzo (2011) and Godfrey et al. (2009). Both are top-cited articles in the third period under the *Financial Performance* theme, in which the social and governance factors are the dominating facets. Others study both the social and environmental sides of business, including how a CEO's family relationship impacts environmental performance (Berrone et al., 2010), or how environmental and social standards contribute toward legitimacy in supply chain governance (Mueller et al., 2009).

The governance facet of ESG leads for the first time in period 4 as the topic of focus of 50% of the most-cited motor-theme articles, followed by the social (36%) and environmental (14%) facets. The top-cited articles classified under governance in period 4 include an analysis of the impact a board of directors has on the quality of CSR disclosure in the U.S. banking sector (Jizi et al., 2014). The focus on the governance dimension of ESG remained prevalent, though declining slightly, in period 5 (to 44%, compared to 35% social and 20% environmental).

Insert Figure 3 About Here

In sum, although the most impactful corporate-sustainability research started with a distinct focus on business and the environment, it has developed over time to include greater emphasis on social and, most recently, governance issues.

Evolution of Dependent Variables & Unit of Analysis

Next, we examine the evolution of the nature of the dependent variables of focus in the most influential empirical articles. Relatedly, we examine the evolution of the unit of analysis these empirical articles employ. We classify articles' dependent variables into one of two categories: whether they represent environmental and/or social outcomes, or financial-performance outcomes (see Fig. 4).⁴

In the first two periods, a large majority of the top-cited articles are environmental- and social-impact-oriented articles (70% in period 1 and 78% in period 2). Specifically, most dependent variables in the research published in these periods relate to the environmental impact of corporations. This is

⁴ Dependent variables classified as focusing on financial outcomes include stock return or growth rate (Russo et al., 1997; McWilliams & Siegel, 2000; Surroca et al., 2010) while those classified as "impact" include a dual approach to valuing SO₂ allowances (Coggins & Swinton, 2003) and examining the connections between the managerial interpretations of environmental issues and corporate choices of environmental strategy among firms (Sharma, 2000).

consistent with observations of the importance of the environment as the main topic of focus in early sustainability research (Van Marrewijk, 2003). Several of the dependent variables have a pollution component, such as the shadow price of SO₂ emissions, derived from secondary data from coal-burning electric utility plants (Coggins & Swinton, 1996); pollution levels (Lopez & Mitra, 2000); and community-level exposure to toxins in the air, measured using socioeconomic, political, and demographic characteristics of the population as proxies (Brooks & Sethi, 1997). The fact that environmental themes, such as *Green Gas Emissions* and *Energy*, were motor themes in the first period (as Appendix 2 shows) further reflects the dominance of the environmental factor and how early research focused more on topics relating to preserving natural resources than on how firms can increase profits.

Insert Figure 4 About Here

In periods 3 and 4, we see the rise of profit-driven dependent variables (66% in both periods). These include such variables as direct accounting ratios (Cheng et al., 2014) and shareholder value (Delmas et al., 2015; Flammer, 2013; Henisz et al., 2014; Godfrey et al., 2009; Surroca et al., 2010). In period 4, we also begin to see themes reflecting the rise of proximal outcome variables that link to profitability, such as measures of *Innovation* (Bocken et al., 2014), reputation, and customer satisfaction via themes including *Consumption* (Saeidi et al., 2013), and employee motivation (Jonese et al., 2014) that such themes as *Job Satisfaction* and *Labor Standards* indicate. In the most recent period, we see an almost equal split of outcomes that are social or environmental in nature (55%) and those that are financial-performance-oriented (49%).

To examine the evolution of the unit of analysis these empirical articles use, we group them into the following types: Individual (Consumer/Household), Firm, Industry, Business Unit, Facility

(Factory/Plant), Country, Community, Article (Literature Review), and Regulation (Standards/Ecolabel/Regulation) (see Appendix 4, Table 2). Perhaps unsurprisingly, the dominant unit of analysis is Firm, which decreases over time from 74% in period 1 to 56% in period 4, then increases to 76% in period 5. We observe an increase and then a decrease in articles using an Individual unit of analysis in the last two periods, from 8% and 6% in periods 1 and 2 to 16% and 18% in periods 3 and 4, and down again to 8% in period 5. We also observe an increase in articles focused on literature reviews, jumping from 2% in period 1 to 20% in period 4 but declining again to 9% in period 5. The proportion focused on country-level comparisons increased from 4% in the first period to 8% in the last. The few articles that focused on a department or functional area within an organization, grouped under Business Unit, saw little change in the use of this unit of analysis (from 0% to 1% between periods 1 and 5). Similarly, Regulation articles were sparse, from 0% to 2% between periods 1 and 5, while the proportions of impactful articles using Industry, Community, and Facility as the unit of analysis all decreased over time.

Evolution of Research Methods

To examine the evolution of the methods the most influential articles used over time, we categorize the methods into six types: quantitative based on secondary data, quantitative based on survey data, qualitative, experimental, theoretical/conceptual development, and review articles (see Appendix 4, Table 3). Overall, quantitative secondary-data analysis was the most commonly used method, with the highest percentages in periods 1 (36%), 2 (34%), 4 (42%), and 5 (59%). At a low of 8% in period 2, quantitative survey data climbed to 23% in period 5. These indicate the authors' preference for using available data sources rather than sourcing their own data. Another example is articles corresponding to the *Socially responsible investment* motor theme in period 2, which mostly use data from such

responsible investing analysis firms as KLD/MSCI (David et al., 2007; Sharfman & Fernando, 2008; Surroca et al., 2010).

The proportion of (non-empirical) theoretically and conceptually focused articles remains relatively stable in the first four periods (from 18% in period 1 to 22% in period 4, peaking at 29% in period 3), dropping to 6% in the last period. Among the most influential sustainability articles, we observe a slight increase and then another decrease in review articles (from 8% to 9% between periods 1 and 5, with a peak in period 3 at 24%). The qualitative category includes articles using case studies, interviews, and focus groups. Its relative volume decreased from 12% in the first period to 4% in the last period. Experiments were the most underutilized methodology in all four periods among the most highly cited articles, with the number of articles using this methodology remaining low and dropping from 6% to 0% between the first and last periods.

Overall, we did not observe large changes over time in the types of methodology that the research in the most influential motor-theme articles employed. We see a preponderance of quantitative articles that rely on secondary data, followed by (non-empirical) theoretical articles and fewer articles relying on quantitative survey data. Qualitative research has been relatively scarce, and the use of experimental techniques was quite rare among the most influential articles.

SUMMARY OF FINDINGS AND IMPLICATIONS FOR FUTURE RESEARCH

The first rows of Figure 5 below summarize an overview of our analysis of the field of corporate sustainability. The columns represent the main foci of our analysis: problem focus, theories, disciplinary approaches, dependent variable, unit of analysis, and methodology. These foci are naturally interconnected, though it is helpful to break them apart in terms of the choice points that researchers

face when writing a research paper. The rows represent the state of the field for each focus of analysis over time. For ease of exposition, the first row indicates the early phases of our analysis (periods 1 and 2), and the second row shows the more recent phases (periods 3 to 5). The last row describes high-level implications for future research. We expound on our summarization in more detail below, and a discussion of the implications for future research follows.

Insert Figure 5 About Here

Summary of the Evolution of the Research Field of Sustainability

Problem area of focus. While corporate sustainability research started with a distinct focus on business and the natural environment, it has developed to include the intersection of business with social and governance issues. This reflects the emergence of the term “ESG” in sustainability research, referencing the three dimensions of environmental, social, and governance factors. Moreover, we observe over time the increasing relative importance of the social and governance dimensions, vis-à-vis that of the natural environment.

Theoretical bases. Research on corporate sustainability originated from two theoretical perspectives. The first, anchored in economics and strategy, builds on the resource-based view. The second, stemming from ethics and evolving into an area of focus on strategy, applies a stakeholder view of the firm. The first perspective originally emphasized the environmental dimension of sustainability as the focal topic/problem, while the second emphasized the social dimension. Over time, the field has combined these two perspectives to incorporate a broader view of sustainability that includes both environmental and social components. However, this work has stopped short of considering the interactions and trade-offs between the environmental and social components.

Furthermore, we notice the emergence of additional approaches, such as perspectives focused on social entrepreneurship, innovation, and governance. This includes consideration of social and family, and, to a lesser extent, traditional enterprises taking a longer-term perspective.

Disciplinary approaches. Originally, the disciplines of economics and strategy dominated the field. Over time, the incorporation of additional perspectives from different areas of business scholarship, including marketing, human resources, operations, entrepreneurship, and finance, has enriched it. In turn, this has broadened the scope of focus of the areas of the firm that can influence and be influenced by sustainability problems and issues. Associated with these changes, we observe a decrease in the proportion of articles published in the General & Strategy and Economics categories over time, and an increase in the share of publications in journals representing other areas of business scholarship, as well as sustainability journals, constituting the majority of publications in the last period.

Dependent variable. We discern a shift away from a majority of environmental-impact-oriented articles early on and toward a majority of articles with profit-driven dependent variables in later years. This coincides with a grounding of sustainability research in economics and strategy, and much of the empirical research in the more recent periods examines the relationship between corporate sustainability and corporate performance. These analyses largely treated the firm as a black box. With the addition of other perspectives to the field, we observe the development of research themes slowly opening up the black box and identifying the organizational mechanisms through which sustainability might influence corporate performance. This recent work has emerged with a focus on the specific stakeholder groups central to each area of management, such as customers, employees, investors, and suppliers.

Unit of Analysis. A change in the focal unit of analysis in sustainability research accompanied the evolution of disciplinary approaches over time. While firms—particularly publicly traded firms—were the main unit of analysis in early sustainability research, we observe a subsequent increase of both supply chains and, within firm types, smaller firms in that role. This correlates with the emergence of sustainability research in operations management and entrepreneurship. Furthermore, with the emergence of sustainability studies in the areas of marketing and human resources, we also observe a slight relative increase in the proportion of studies with the individual as the unit of analysis (e.g., consumers, employees, households).

Methodology. Both early and recent periods show a preponderance of quantitative analyses using secondary data. The use of qualitative and experimental techniques in sustainability research has been relatively scarce.

POTENTIAL NEW DIRECTIONS FOR FUTURE RESEARCH

While the methodology this paper employs precludes us from directly evaluating the effectiveness of corporate sustainability research for addressing or solving societal grand challenges,⁵ it is clear and important to note that while the number of corporate sustainability research publications has increased drastically in the last three decades, so have societal problems relevant to sustainability research. Climate change is perhaps the best example, with millions of people, organizations, and governments facing challenges due to extreme weather-related events, as well as negative trends in health, food security, livelihood security, migration, water security, and related risks (Portner et al., 2022). The fact

⁵ The terminology of societal grand challenges was included in United Nation 2030 Agenda for Sustainable Development 2030. See <https://sdgs.un.org/2030agenda>

that these problems are only accelerating despite the increase in sustainability research highlights the imperative for a different approach to this research if one of its goals is to help organizations better adapt to and ultimately preclude the exacerbation of these environmental and societal challenges. Relatedly, while sustainability research has evolved and progressed over time, scholars have an opportunity to push the future boundaries of this research.

Toward the twin goals of improving the state of sustainability research and affecting positive change, we argue the need to broaden our scope of focal constructs and employ in our research different dependent variables that actually measure the impact of firms on society. We need more precise measurement of constructs and effects of interest, which will likely involve more direct engagement with firms. We must consider potential trade-offs between different types of sustainability objectives (e.g., between “E,” “S,” and “G”). We must build new theoretical approaches and better understand how individuals within firms behave (micro-level mechanisms), as well as how firms interact with each other and the whole economic and political system (macro-level systems). We expound on these suggestions in what follows.

Implications for Future Dependent Variables of Focus

While it is perhaps unsurprising that firm profitability has been the predominant dependent variable of focus in corporate sustainability research to date, given the importance of the bottom line to business-oriented research more broadly, it has somewhat constrained corporate sustainability research (Dyllick & Muff, 2016). Analyses focused on the effects of sustainability practices on firm performance are certainly important, but they preclude understanding whether and how such actions or practices impact the environment or society, as well as whether there are trade-offs between truly “doing good” and

“doing well.” Understanding that is necessary from a theoretical perspective, as well as from a practical perspective, to provide companies with effective recommendations regarding how and under what circumstances they can do good for society and the environment and the implications of their doing so.

From Profit to Impact

Scholars must continue the recent trend of increased focus on social and environmental impact as the focal dependent variable in sustainability research. However, for future research to effectively examine the impact of corporate sustainability practices on society and the environment, scholars must think more deeply about which metrics of environmental and societal impact to develop and analyze. This is an important enterprise. So far, private rating organizations have taken the lead in developing metrics that relate to the Environmental, Social, and Governance facets of sustainability (Delmas et al., 2013). Corporate sustainability researchers have not participated in this process other than to criticize it, concluding that the metrics are unreliable, largely invalid, not up to scientific standards, and susceptible to use for greenwashing (Zhou et al., 2017). Access to reliable, accurate measures of impact on society and the environment is essential for research to yield valid conclusions and to avoid the possible use of the metrics for greenwashing. Generating such measures will likely require corporate sustainability researchers to collaborate with both private rating organizations and natural scientists. For example, addressing the possibility that corporate cumulative environmental impacts may cross an ecological threshold requires the engagement of natural scientists (Kareiva et al., 2015) and not just management researchers.

Furthermore, researchers breaking down the multidimensional construct of corporate sustainability into its different facets (Burbano et al., 2018)—i.e., moving beyond aggregated sustainability scores, such as those of KLD/MSCI, as the independent variables of focus—will improve our understanding of

how corporate sustainability choices and actions impact society. Not only are these aggregated scores noisy measures of a firm's actual corporate sustainability levels (Chatterji et al., 2009; Chatterji et al., 2016). The aggregation of varied sustainability constructs also makes interpretation of results difficult and identifying differential effects challenging (Chen & Delmas, 2011; Delmas & Doctore-Blass, 2010; Mattingly & Berman, 2006; Rowley & Berman, 2000). Indeed, opportunities exist to study more finely grained sustainability activities and practices, to better understand whether and how businesses create or destroy value for society (Godfrey et al., 2009).

Understanding Trade-offs

While most corporate-sustainability research seeks to reconcile firm performance with environmental and social considerations (Marcus, 2009), inherent tensions and trade-offs between these considerations are often ignored (Hahn et al., 2010).

Furthermore, while we observed the growth of research addressing both environmental and social dimensions in the field, how these dimensions interact remains unclear. Research to date has not yet considered potential trade-offs between the environmental and social (as well as governance) dimensions. For example, the notion of environmental justice represents an important shift away from the traditional view of environmentalism that mainly concerned conservation of threatened plants, animals, and wilderness areas. Environmental justice links to social justice as an all-encompassing notion that affirms the value of life in all forms, against the interests of wealth and power and the abuse of technology (Cock, 2011). The key concern is not only to protect limited resources but to ensure that using resources benefits all, not just the privileged few. Environmental and social objectives are not always complementary, but turning a blind eye to trade-offs results in an incomplete perspective on

corporate contributions to sustainable development (Hahn et al., 2010). Recognizing tensions and potential trade-offs between these dimensions is important.

Adopting Interdisciplinary Approaches

Corporate sustainability research has diffused throughout the fields of management and strategy, organizational behavior, marketing, operations, and accounting. This parallels the dissemination of sustainability concerns, practices, and focus through the different organizational areas of the firm, including marketing, supply chain and operations, human resources, and strategy (Hoffman, 2001). The expansion of research into these different management areas is useful for better understanding strategic implications of various sustainability-oriented practices or firm concerns, as well as for identifying potential firm-led solutions to improve the planet and the broader society. However, going forward, it is important that disciplinary focus does not create research silos. While the research topic areas are highly complementary, the disciplines represent only limited synergy and dialogue (Quarshie et al., 2016; Rajeev et al., 2017). Additionally, there is potential for innovative research to emerge from management researchers engaging and collaborating with researchers in the natural sciences (Whiteman et al., 2013). In particular, the corporate sustainability journals can play an important role in facilitating, fostering, and incentivizing cross-fertilization across disciplines and with the natural sciences.

Future Theoretical Focus: A Multilevel Approach of Individual-level Motivations, Systems, and their Interactions

To fully understand the implications of corporate sustainability practices and actions, critical for both research validity and for practical purposes, we need to not only measure how such practices and

actions will influence society or the environment but also to better identify the processes through which the firms implement them (Brockner, 2016). This requires the development of robust theories of organizational change adapted to sustainability issues (Jick & Sturtevant, 2017). Any such process involves both individual and broader systems-level considerations. We argue that robust theories of corporate sustainability and organizational change require examination on both levels.

Opening the Black Box and Bringing in Individual-level Motivations

First, we need a better understanding of the motivations and incentives of individuals within organizations, such as CEOs, firm founders, boards of directors, managers, employees, customers, and investors, to adopt sustainable practices and behaviors (DesJardine & Shi, 2021). This points to an opportunity for corporate sustainability research to focus on the behavioral elements of proposed solutions. For example, firm leaders' and managers' compensation schemes and performance reviews primarily depend on the company's financial performance, as opposed to ESG-related metrics that usually apply to social-performance outcomes (e.g., Flamer et al., 2019). Individual perceptions of time are also central to shaping strategic action on sustainability; most practices take time to implement and adopt, requiring better knowledge of how to shape such perceptions (Bansal et al., 2022).

Economists have developed stylized models that provide a first step toward helping us to understand behavioral decisions, but including so many behavioral assumptions somewhat limits their applicability in the complex real world (Shogren & Taylor, 2020). An understanding of firm stakeholders' perceptions of and behavioral responses to different corporate sustainability practices and actions remains critical to our understanding of CSP mechanisms and contingencies that may benefit or harm the firm (e.g., Farooq et al., 2017). Research has shown this understanding to be important for such stakeholders as employees (e.g., Bode et al., 2015; Bode & Singh, 2018; Burbano 2016, 2019,

2021; Burbano & Chiles, 2021; Burbano et al., 2018; Delmas & Pekovic, 2012; Delmas & Pekovic, 2018; Rupp et al., 2006; Flammer & Luo, 2017), consumers (e.g., Casadesus-Masanell et al., 2009; Delmas & Colgan, 2018; Du et al., 2007; Elfenbein & McManus, 2010; Servaes & Tamayo, 2013), regulators (e.g., Koh et al., 2013), activists (e.g., Baron & Diermeier, 2007; Henisz et al., 2013), the media (e.g., Luo et al., 2012), and capital providers (e.g., Cheng et al., 2013; Ioannou & Serafeim, 2014).

Despite this recognition that individual stakeholders are key to unlocking the link between corporate sustainability practices and firm value, the emerging studies conducted at the individual level of analysis notably still make up a small proportion of corporate sustainability research. An opportunity exists for sustainability scholars to conduct more studies at the individual level of analysis, to provide insight into critical firm stakeholders' responses to corporate sustainability. Within these individual-level studies, most research to date has elicited individuals' stated preferences or behavior in response to hypothetical corporate sustainability-related practices, with an opportunity for future research to examine stakeholders' revealed preferences and actual behavior at the individual level (Abraham and Burbano, 2022; Brockner, Senior, & Welsh, 2014, Burbano, 2016, 2019, 2021; Burbano & Chiles, 2021; Shea & Hawn, 2018).

Systems Thinking

While a focus on the micro level is critical for understanding motivations and mechanisms within organizations as well as between organizations and stakeholders, we also simultaneously need a better understanding of implications for the respective roles of environmental, economic, and social systems. The need to better understand systems applies to both objectives of (1) helping firms better understand

the strategic implications of ESG-related practices and initiatives and (2) improving society and the environment.

With respect to the former, where researchers focus on examining the strategic implications for firms, it is critical to study the implications of the interdependence of the various parts of the system for the business prospects of firms. We cannot effectively examine and predict longer-term performance in particular, without considering the interconnectedness of a firm within its various contexts, such as industry, supplier, regulatory, and governmental environments. This is particularly important for understanding trade-offs between sustainability practices and corporate performance.

With respect to the latter, the state of the planet calls for changes in large-scale sustainability practice, involving not singular but systemic adoption of markedly better environmental and social practices. We need a better understanding of the aggregate role of corporations and government in promoting change at the societal level. Despite many instances of firms voluntarily adopting sustainable practices, whether these lead to substantive sustainable outcomes at the sectoral or industry level, let alone at the country or world level, is unclear (King & Lenox, 2000; Rivera, 2002; Steelman & Rivera, 2006). For example, corporate sustainability research has identified the potential value that individual firms could capture by adopting green practices, but it has fallen short of providing a general collective-action framework to explain how the adoption of substantive sustainable practices at the sectoral level is likely to occur without government involvement (Delmas et al., 2019).

Research on supply chains that takes a broader view of firm operations by considering its suppliers as part of the equation (Zhu et al. 2013) is a step toward envisioning the broader system in sustainability research. Studies at the sectoral level (Wijen & Chiroleu-Assouline, 2019) or the state

level (Crifo et al., 2019; Vogel, 2019) will also improve our understanding of the drivers and implications of sustainability practices at levels closer to the broader system.

Systems thinking does not imply a sole focus on a macro-level approach but a multilevel approach that explicitly incorporates the role of individuals in addition to macro considerations (Starik & Rands, 1995; Landrum, 2018; Schilke, 2018). A systemic and multilevel analysis of the interdependence between the pressures of institutions and stakeholders can better explain a firm's response to complex societal issues than one limited solely to institutions or stakeholders (Grewatsch et al., 2021). The call to integrate the micro- and macro-level understandings of sustainability is not new, initially proposed by Starik and Rands in 1995, but it has proved challenging to answer. Indeed, a multilevel perspective requires not only an evaluation of the relative influences of institutional and peer-firm pressures on businesses, but also the depiction of how firm characteristics, industry structure, and individual behavior moderate these pressures, as well as an examination of the impact of sustainability practices on the socioecological context (Dyllick & Muff, 2016). This multilevel perspective often requires knowledge of levels or systems that specific fields master with certain methodological approaches, requiring researchers to incorporate approaches from other fields and/or push the frontiers of their own.

A Focus on Government and Governance

Government regulations have played a major role in shaping firm corporate sustainability (Aragon-Correa et al., 2020, Delmas & Young, 2009; Majumdar & Marcus, 2001). Interestingly, relatively few recent studies address the role of government and regulation in influencing corporate sustainability or firms in influencing government or regulation.

Astute firms can play an important role in either adopting voluntary practices to avoid regulation (Delmas & Montes-Sancho, 2010) or shaping regulation to their advantage through their Corporate Political Activity (CPA) (Vogel, 2007; Werner 2017; Minefee et al., 2021). For example, the increased amount of money spent on lobbying related to climate change is an indication of CPA in the domain of corporate sustainability (Delmas et al., 2016). Some have argued that “compared with companies’ efforts to green their operations, corporate political actions such as lobbying or campaign funding can have more influence on environmental protection, and arguably represent the greatest impact a company can have on protecting—or harming—the environment” (Schendler & Toffel, 2011). From this perspective, CPA may be the most important element of a company’s sustainability strategy determining its impact on society and the environment (Lyon et al., 2018). Thus, a need and an opportunity exist for sustainability researchers to study firms’ CPA, relative to sustainability-oriented topics.

In our analysis, we observed a recent rise in the number of studies focused on business governance, the last letter of “ESG.” Corporate governance represents the arrangement of rules, practices, and processes that direct and control a firm. Such arrangements can constrain managers legally to focus exclusively on profit. The development of new governance models, such as social enterprises that embed social purpose within a business enterprise, show promise of relaxing these constraints. In the U.S., for example, having the status of “benefit corporation” endows the corporation with a social and environmental conscience, authorizing the pursuit of corporate purposes in addition to maximizing stockholder welfare (Cao & Gehman, 2021). This legal structure extends the fiduciary duties of executives to non-shareholder stakeholders (Smith & Rønnegard, 2016). However, this new structure is not without challenges. The primary challenge that social enterprises face is to balance the logic of

achieving financial sustainability with that of creating social impact. Further research should investigate how leaders can manage the tension regarding how an organization should weigh these two logics. Another challenge is investors and other stakeholders accepting and responding to this new governance structure (Copper & Weber, 2021). This raises interesting questions of whether and how such new governance structures can diffuse through the marketplace to become feasible and common options.

Future Methods of Focus

Methods in corporate sustainability research have centered mostly on the analysis of quantitative archival or survey data. Both methods have advantages as well as limitations that point to opportunities for future work to improve the rigor of sustainability research. Quantitative archival data can facilitate analyses with a longitudinal perspective, but organizations outside of academia often gather the data with lower criteria for rigor and validity in measurement. Surveys provide important insights into stated preferences or behavior at the individual and firm levels, but they prove to be poor predictors of actual behavior. Inherent in both methods are firms and managers typically acting as subjects rather than active partners in the development of knowledge. The transfer of knowledge from research to practice through academic articles is less effective than that which occurs when researchers and managers form a learning community that produces knowledge (Sharma & Bansal, 2020). Indeed, the actual impact of sustainability research on the world of practice is limited (Chabowski et al., 2011; Harrington, 1995; Starik et al., 2016; Williams & Whiteman, 2021). We need corporate sustainability researchers to step out of the ivory tower, collect their own field data, and develop in-depth, engaged research with practitioners, with greater practical relevance. Hahn et al. (2021, p. 9) note that with sustainability issues, researchers “need to be able to speak with others in a way that it connects and has some

resonance, and it's probably not going to happen through a deep foray into resource dependence theory!"

There is thus an opportunity for undertaking future research in collaboration with firms, with implications for a likely shift in focal methodologies. Engaged experimental research, with access to the organizational workings of corporations, can facilitate the identification of solutions and recommendations that these and other corporations will more likely actually implement. This is challenging because the differences between research and practice knowledge systems are so vast (Kieser & Leiner, 2009; McKelvey, 2006). Academic incentives for researchers to impact practice remain low; firms often operate on different timeframes than researchers, and confidentiality issues can make firms opening their doors to researchers difficult.

Using Field Experiments & Knowledge Co-creation Events

Two possible avenues to address these challenges appear here. First, sustainability researchers can collaborate with organizations to conduct field experiments, a methodology that some consider the gold standard of research to understand the drivers of behavioral change and causality (Delmas & Aragon-Correa, 2016), thus far underutilized in sustainability research (Amengual & Apfelbaum, 2021; Burbano, 2016, 2021; Portocarrero and Burbano, 2022; Spicer et al., 2021; Salmivaara & Lankoski, 2021), as well as in management research more broadly (Chatterji et al., 2016). Technical and organizational innovations must be field-tested to understand the chances of success on a larger scale. While some critics view the usage of field experiments in policymaking as premature, pointing to the fact that many experimentally tested programs fail to deliver their promise at scale, recent research uncovers approaches to help experiments to scale (Al-Ubaydli et al., 2021; List, 2022).

Second, researchers can develop a system of knowledge co-creation (Sharma & Bansal, 2020), in which both managers and researchers participate in discussions, projects, and events on a research problem where their interests overlap. One important element that contributes to the success of this model is establishing continuity across events. One way to connect events is to produce “objects,” such as reports that are not final but to which both managers and researchers can contribute, in preparation for the next event (Sharma & Bansal, 2020).

CONCLUSION

While the field of corporate sustainability has grown tremendously in the last three decades, there is an opportunity to continue to push the boundaries of this research. As the prior section discussed, doing so will be critical for achieving two aims: first, to continue to improve the validity and quality of sustainability research; second, to increase the practical impact of this research, as well as its potential to address the burgeoning social and environmental challenges facing our planet.

We need to combine different areas of knowledge and expand our methodologies. We need to combine a better understanding of the mechanisms that drive both environmental and social practices within the whole organization with a better comprehension of the impacts of these practices on society. An understanding of individual-level motivations will be key to identifying how to incentivize and encourage substantive actions by CEOs, boards of directors, employees, customers, and investors. Systems thinking will also be critical to achieving this, given the need to understand the aggregate role of corporations, as well as that of government, in promoting systemic change that can improve society and the environment. Future research could employ a multilevel approach that explicitly incorporates

the role of individuals, the firm, and its supply chain, in addition to more systems-level, macro considerations.

Innovative research is more likely to emerge from researchers who collect original data and collaborate across management disciplines, as well as with researchers in the natural sciences. Likewise, to ensure our research is applicable and has an impact, there is an opportunity to collaborate with managers, firms, industry associations, and policymakers. In an ideal world, researchers could work with businesses and governments to devise innovative governance structures, motivation systems, and regulations.

Let's be bolder. Now is an opportune time.

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FIGURES

Figure 1. Corporate sustainability-related articles, by time period

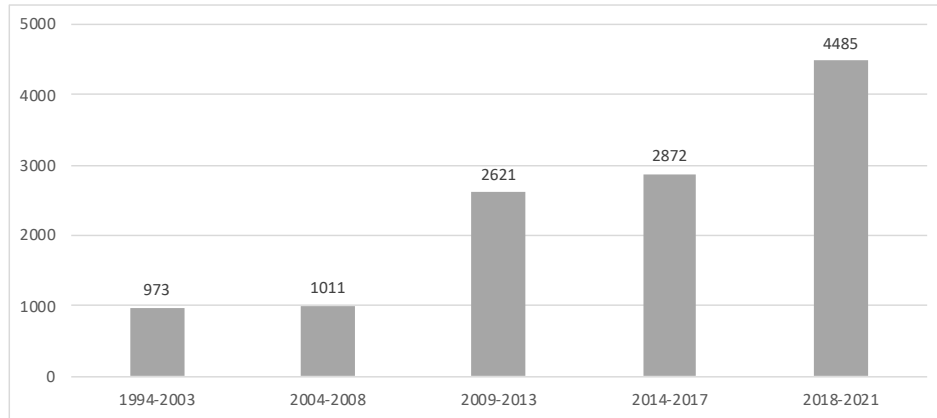


Figure 2: Sustainability & non-sustainability journals field classification*

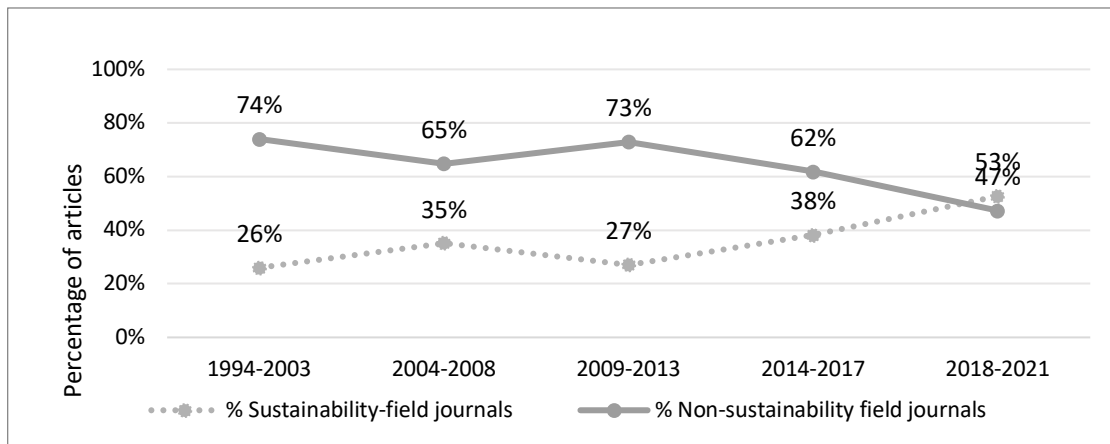


Figure 3. ESG factors per period*

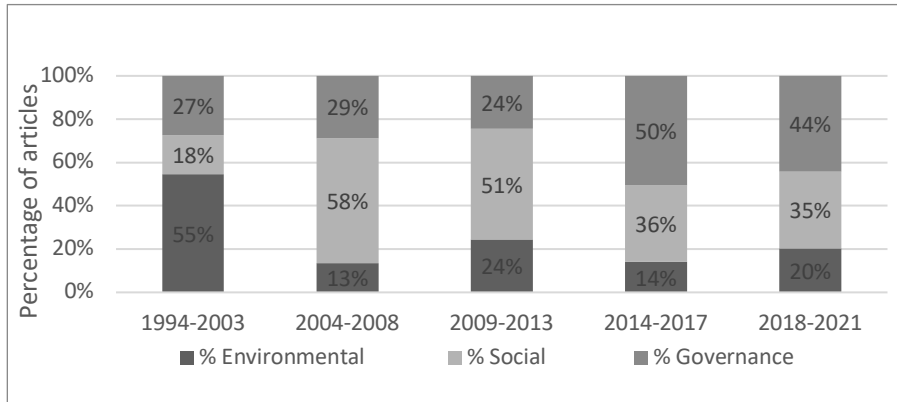
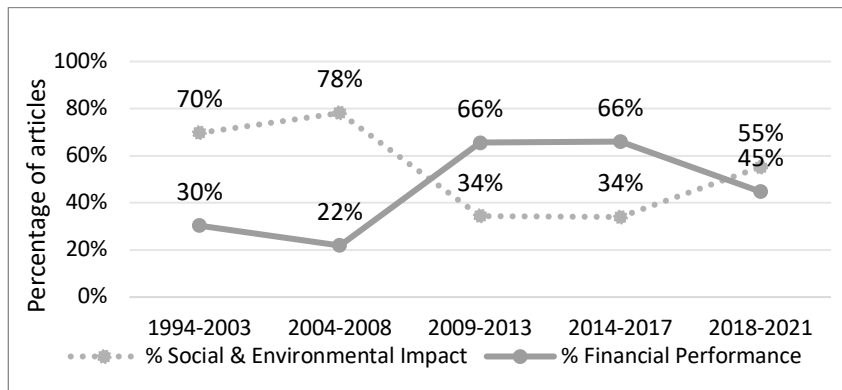
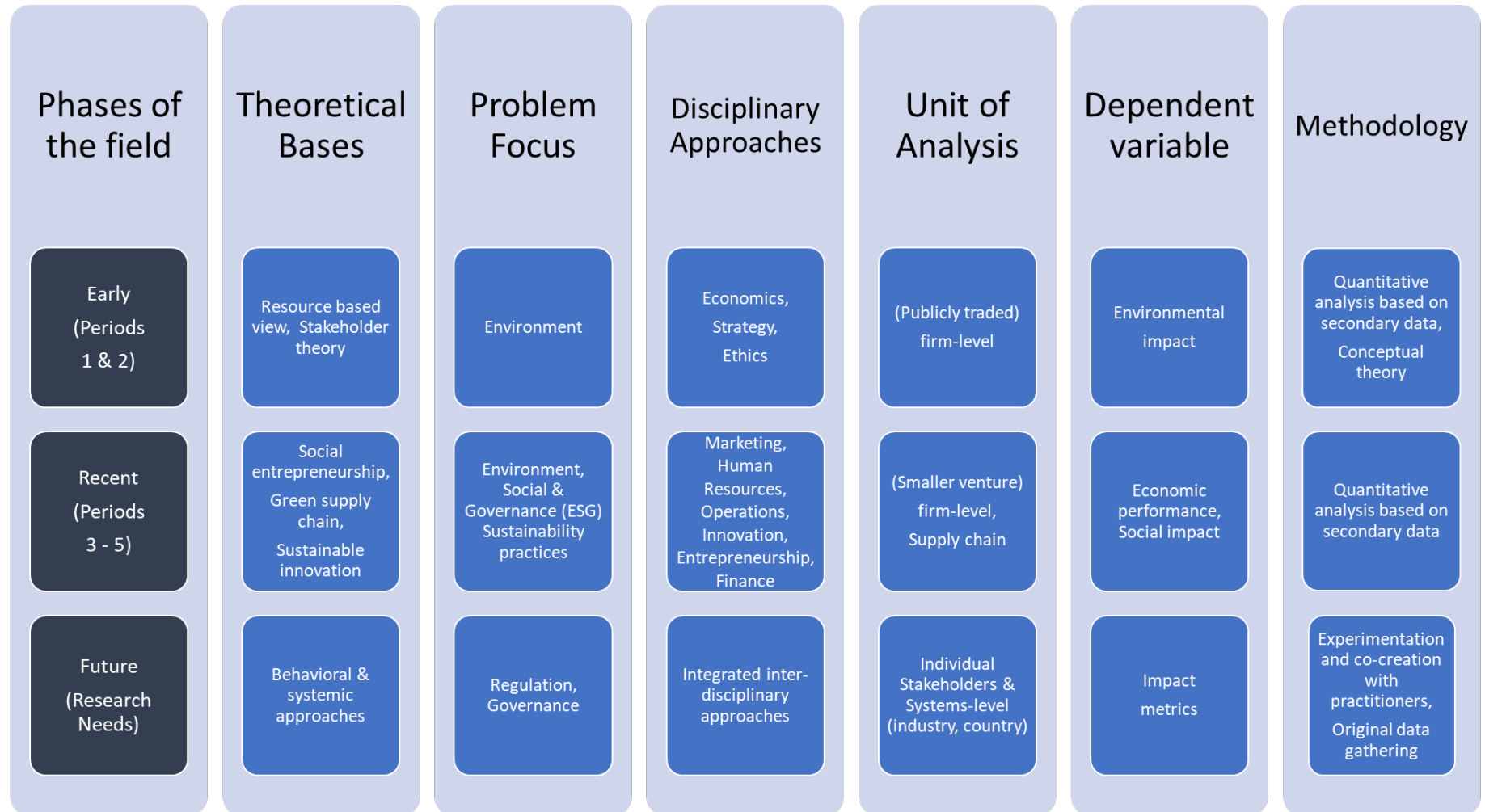


Figure 4. Dependent variables of focus: Social impact versus financial performance*



*Note: Figures 4, 5 and 6 are based on top 10 cited articles in each motor theme.

Figure 5. Summary of findings & implications for future research



APPENDICES

Appendix 1: Methodology Detail

Step 1. Determination of keywords of focus. First, we retrieved a set of documents (i.e. the data corpus) to define the research field based on a set of keywords which were identified in consultation with experts in the field. In particular, a survey was distributed to the Organization and the Natural Environment (ONE) and Social Issues in Management (SIM) groups of the Academy of Management (AOM) in August 2015, as well as to the Alliance for Research on Corporate Sustainability (ARCS) listserv, asking for input on a list of 159 keywords which were comprised of keyword lists provided by the ONE and SIM groups, as well as the Business & Society Journal. This list included keywords related to all three commonly acknowledged environmental, social, and governance (ESG) aspects of sustainability (Dyllick & Hockerts, 2002; Van Marrewijk, 2003). The survey asked scholars to indicate the degree to which each potential keyword would identify articles related to the field using a 5-point agreement Likert Scale. We received 37 responses to the survey. From the initial list of keywords, we kept those keywords with mean survey responses less than 3 (i.e., where the mean response was strongly agree/agree). Deviations of the words (e.g., plurals) were added to the list of keywords. See below for the full list of 136 keywords used.

TS = ("alternative energy" OR "alternative energies" OR "business and environment" OR "climate change" OR "corporate social performance" OR "corporate social responsibility" OR "CSP" OR "CSR" OR "domini social 400 index" OR "DS400" OR "ecolabel" OR "ecolabels" OR "eco-label" OR "eco-labels" OR "ecology" OR "ecological" OR "ecosystem" OR "ecosystems" OR "energy" OR "energies" OR "environment" OR "environment and strategy" OR "environment and trade" OR "environmental social performance" OR "ESP" OR "environmental agreements" OR "environmental agreement" OR "environmental assessment" OR "environmental assessments" OR "environmental attitudes" OR "environmental attitude" OR "environmental behavior" OR "environmental behaviors" OR "environmental capabilities" OR "environmental capability" OR "environmental communication" OR "environmental communications" OR "environmental concern" OR "environmental concerns" OR "environmental disclosures" OR "environmental disclosure" OR "environmental economics" OR "environmental entrepreneurship" OR "environmental ethics" OR "environmental initiatives" OR "environmental initiative" OR "environmental innovation" OR "environmental innovations" OR "environmental investments" OR

"environmental investment" OR "environmental issues" OR "environmental issue" OR "environmental justice and ethics" OR "environmental justice" OR "environmental ethics" OR "environmental litigation" OR "environmental management" OR "environmental partnerships" OR "environmental partnership" OR "environmental perception" OR "environmental perceptions" OR "environmental performance" OR "environmental policy" OR "environmental policies" OR "environmental proactivity" OR "environmental programs" OR "environmental program" OR "environmental protection" OR "environmental protections" OR "environmental regulation" OR "environmental regulations" OR "environmental reporting" OR "environmental risk management" OR "environmental strategy" OR "environmental strategies" OR "environmental supply chain management" OR "environmental sustainability" OR "environmental technology" OR "environmental technologies" OR "environmental voluntary agreements" OR "environmental voluntary agreement" OR "environmentalism" OR "ESG" OR "fossil fuels" OR "fossil fuel" OR "green" OR "ISO 14001" OR "KLD" OR "Kinder Lyndenber Domini" OR "natural disasters" OR "natural disaster" OR "natural environment" OR "natural environments" OR "pollution" OR "renewable energy" OR "renewable energies" OR "resource based view sustainability" OR "RBV sustainability" OR "right to know" OR "right-to-know" OR "shareholder activism" OR "shareholder activist" OR "social responsible investments" OR "SRI" OR "socially responsible investing" OR "socially responsible investor" OR "socially responsible firm" OR "socially responsible firms" OR "socially responsible investing" OR "sustainability" OR "sustainable" OR "toxic release inventory" OR "toxic release inventories" OR "triple bottom line" OR "triple-bottom-line" OR "wind power".

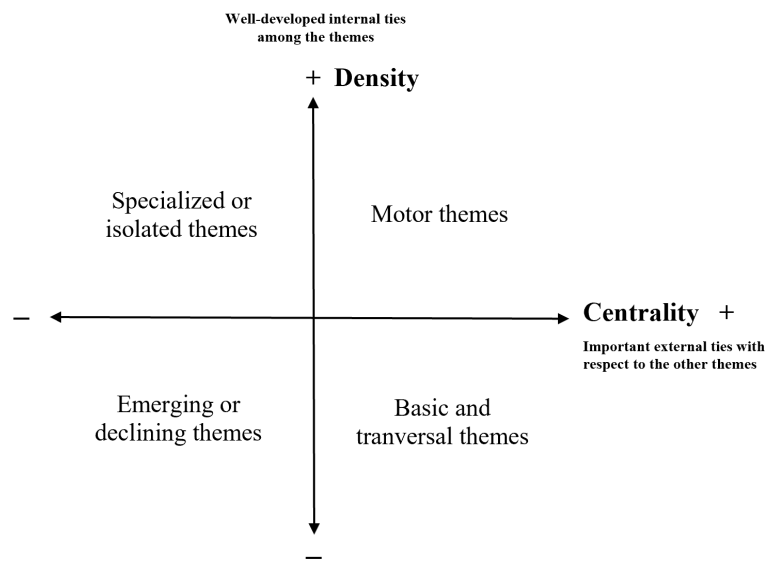
We retrieved published articles in the ‘Business’ category of the Web of Science (WoS) database which contained any of these keywords in the title, abstract or list of article keywords.¹ Due to space constraints, detail on the steps of data acquisition and pre-processing (step 2), as well as detection of themes and research impact analysis (step 3) are included in the Appendix. At the end of these steps, a total of 11,962 documents published between 1994 and 2021 remained in the dataset.

Step 2. Themes visualization and categorization. In this last stage of the process the themes detected in each period by the clustering algorithm are visually represented in a strategic diagram of thematic networks. Each theme takes the name of the most central keyword (the one with the most connections to the other keywords in a given cluster). The two-dimensional strategic diagram groups the detected themes in four quadrants according to 1) their centrality (i.e. the degree of interaction of a network with other networks) and 2) their density (i.e. internal strength of the network). Thus, the

¹ All 115 journals under the category “Business” listed in the Web of Science Incites Journal Citation Reports.

strategic diagram classifies the themes into four quadrants (see Figure 1 and Appendix 3). Themes in the upper-right quadrant are both well developed and important for the structuring of a research field. They are known as the motor-themes of the field, given that they present strong centrality and high density. Themes in the upper-left quadrant have well-developed internal ties but unimportant external ties, and therefore are of only marginal importance for the field. These themes are very specialized and peripheral. Themes in the lower-left quadrant are both marginal and weakly developed. The themes in this quadrant have low density and low centrality, and mainly represent either emerging or declining themes. Themes in the lower-right quadrant are important for a research field but are not yet well developed. This quadrant contains transversal and general, basic themes. SciMAT also produces a thematic network for each individual theme, showing a network graph (cluster) with the keywords for a given research theme and the links between them (see Figure below for an example).

Figure 1. Quadrants in the strategic diagram



Notes: Motor themes are well-developed and important for the structure of the research field; Specialized or peripheral themes are well-developed but not highly relevant for the structure of the field; Emerging or disappearing themes - both weakly developed and marginal; Basic or transversal themes are important for the research field, although not mature.

Step 3. Data acquisition and pre-processing. The WoS database is one of the most comprehensive bibliographic databases in the fields of science and the social sciences (Archambault et al., 2009). The retrieved articles were published between 1973 and 2021 but given that publications between 1973 and 1993 did not contain any keywords and many did not have an abstract, we excluded these earlier years from our database.² Once the corpus was retrieved, two groups of research assistants independently conducted a manual review of the entire corpus to remove documents that did not fit with the research field under study.³ In cases where the research assistants' assessments differed, the authors reviewed the articles and agreed on whether to include or exclude the articles in question. At the end of this process, a total of 11,962 documents published between 1994 and 2021 remained in the dataset.

With the corpus cleaned, the data was then preprocessed. Given our objective to identify the main topics of the field over time, we used the keyword as the unit of analysis. A given article's keywords included keywords selected by the articles' authors as well as the keywords assigned by the ISI's KeyWords Plus technology tool.⁴ For documents without any keywords, a semi-automatic process was

² As the field of sustainability is relatively new (e.g., the Organizations and the Natural Environment, or ONE, group of the Academy of Management was formed in 1995), exclusion of these early years from our database does not seem problematic.

³ For example, "sustainability" is a keyword which identifies articles relevant to corporate sustainability as per our focus, but it also identifies articles that are outside our area focus such as those examining the sustainability of competitive advantage. As such, each research assistant identified whether a given document fit the intended construct of corporate sustainability or did not.

⁴ Author-supplied keywords represent the main concept or techniques that authors employed in the article whereas KeyWords Plus goes a step further to include additional terms extracted from the titles of articles cited by the authors in their bibliographies and footnotes (Garfield, 1990). Garfield, E. (1990). Keywords plus-ISI's breakthrough retrieval method. 1. Expanding your searching power on current-contents on diskette. *Current contents*, 32, 5-9.

applied to check if keywords in our database were present in the title or in the abstracts of those documents. If there was a match, these keywords were assigned to the corresponding article. Additionally, a de-duplication exercise was carried out, grouping keywords that represented the same concept (for example, corporate social responsibility and CSR) and removing broad keywords that were not informative (for example, “framework”).

The final step in this stage of the process was to divide the corpus into five consecutive time periods: 1994-2003, 2004-2008, 2009-2013, 2014-2017 and 2018-2021, with 973, 1011, 2621, 2872 and 4485 publications, respectively. These time periods were informed by important dates in the field of sustainability (e.g., the Organizations and the Natural Environment (ONE) interest group was added as a division of the Academy of Management (AoM) in 1995, the Alliance for Research on Corporate Sustainability (ARCS) was created in 2009),⁵ as well as to ensure enough documents per period to facilitate analysis and a comparable number of years per period.⁶

Step 4. Detection of themes and research impact analysis. After the keywords de-duplication and period division, a process was carried out to detect the field’s themes. This process is based on co-words bibliographic networks analysis which is a conceptual representation of the concepts covered in a network (Callon et al., 1983). A co-words network is a network based on keyword co-occurrence,

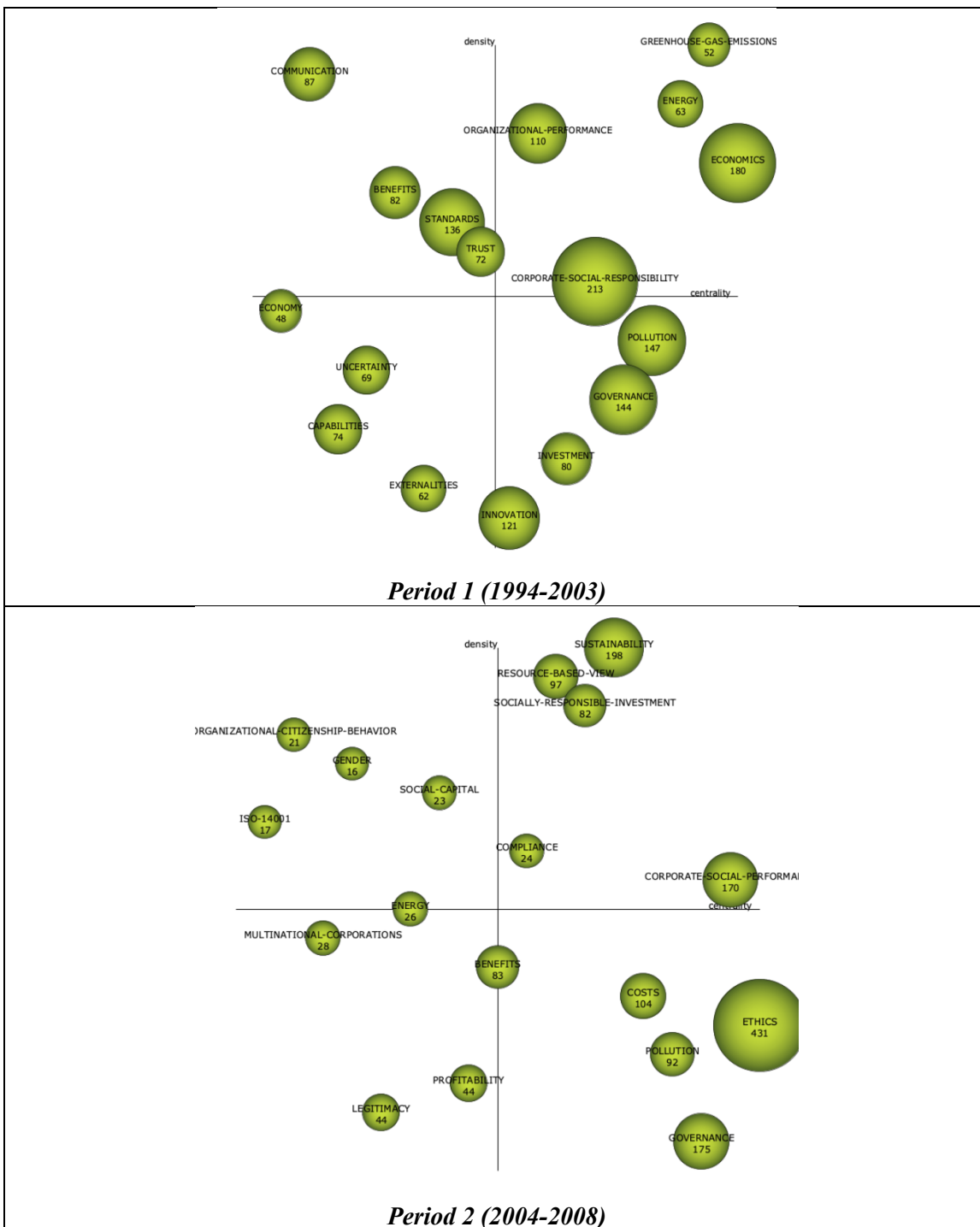
⁵ Note: Time periods are delineated by years of creation of important sustainability-related organizations. Namely, the Organizations and the Natural Environment (ONE) was added as a division of the Academy of Management (AoM) in 1995; the Group for Research on Organizations and the Natural Environment was created in 2003; the Alliance for Research in Corporate Sustainability was created in 2009 and the theme of the Academy of Management Meetings in 2009 was “Green Management Matters,” United Nation Sustainable Development Goals (SDGs) were developed in 2014 and adopted in 2015 at the Paris Agreement, the International Panel on Climate Change (IPCC) report on the impacts of global warming of 1.5 °C state that we may have as few as twelve years to act or pass the point of no return).

⁶ The first period includes 10 years to ensure enough documents for analysis in a given period. The next two periods are 5 years each. The last period is just 4 years, given when we conducted the analysis (2021 was the last full year of data available at the time we pulled the articles from WoS).

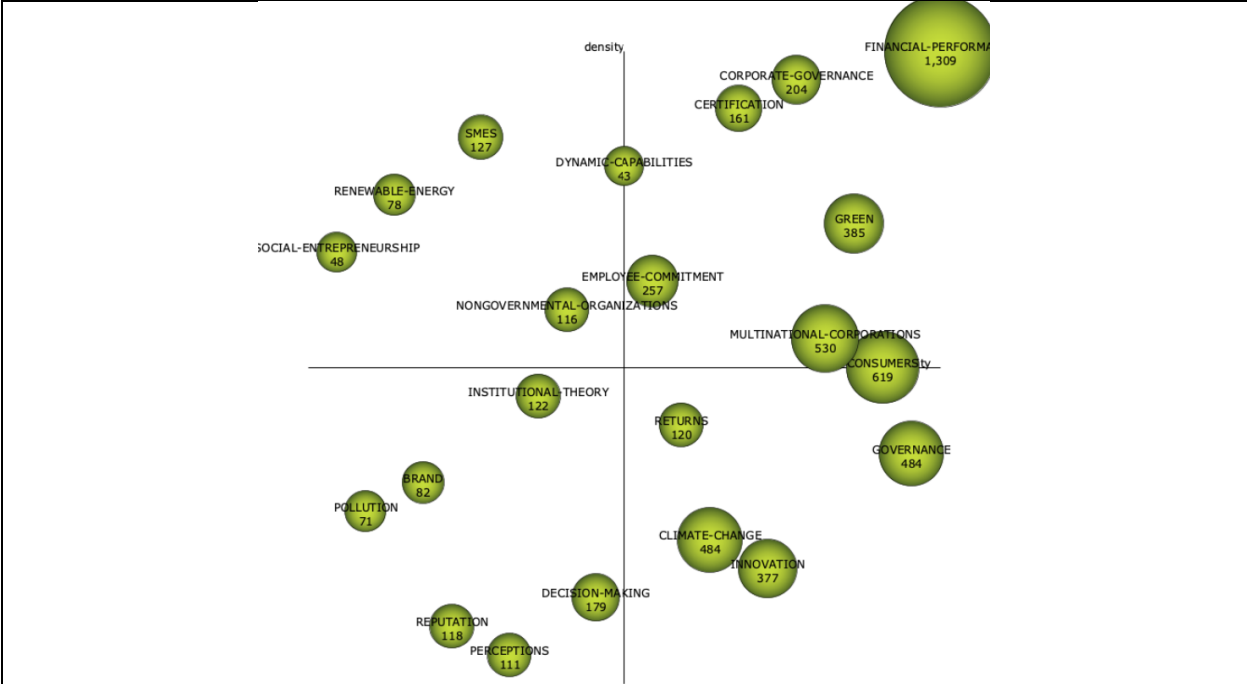
where the nodes are the keywords and the arcs among them represent a co-occurrence relationship. Specifically, the co-occurrence frequency of two keywords was extracted from the corpus by counting the number of documents in which the two keywords appeared together. This relationship is weighted by taking into account the number of documents where the two keywords co-appear (i.e. raw co-occurrence frequency), and normalizing it using the equivalence index measure. Finally, a clustering algorithm was applied in order to divide the whole network into topics or themes (i.e. groups of keywords with a strong co-occurrence relationship).

Next, the relative contribution of the research themes to the entire field of corporate sustainability was measured and used to identify the most prominent, most productive and highest-impact themes. The bibliometric indicators used to measure the production and scientific impact of each topic and thematic area included the number of published documents, number of citations, and different types of h-index (Hirsch, 2005).

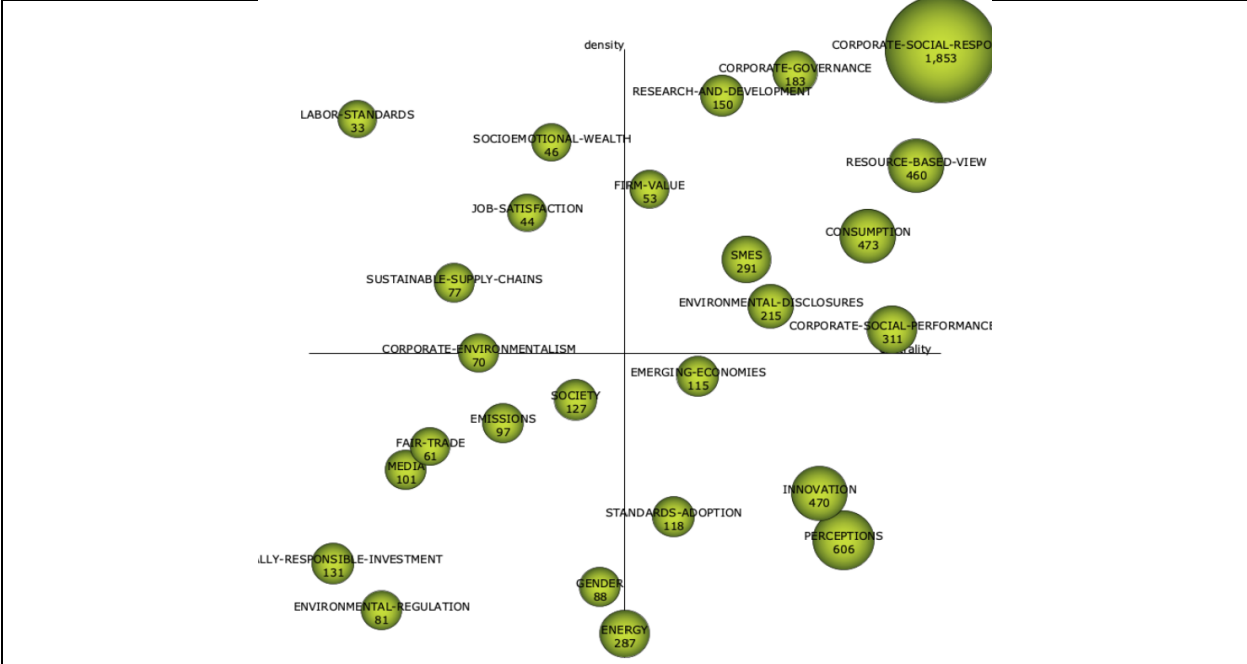
Appendix 2: SciMAT-generated strategic diagrams



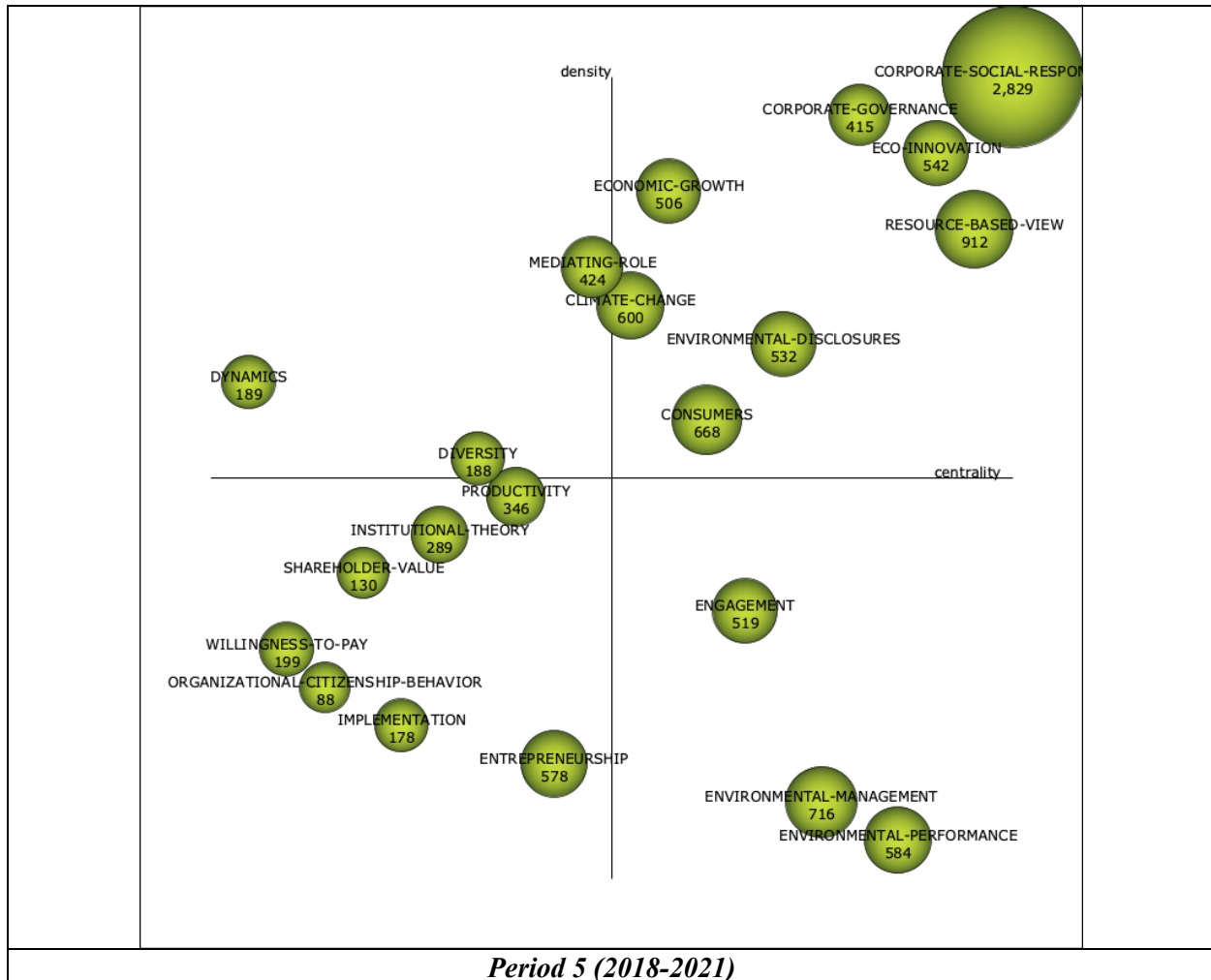
Note: As a reference, the motor themes (URH quadrant) are (Period 1) Energy, Green Gas Emissions, CSR, Organizational Performance, Economics; (Period 2) Corporate Social Performance, Resource-based View.



Period 3 (2009-2013)



Period 4 (2014-2017)



Note: As a reference, the motor themes (URH quadrant) are (Period 3): Certification, Multinational Corporations, Corporate Governance, Green, Consumers, Financial Performance, Employee Commitment, Dynamic Capabilities; (Period 4): Corporate Governance, R&D, Environmental Disclosures, CSR, SMEs, Corporate Social Performance, Firm Value, Consumption, Resource-based-view; (Period 5): Mediating role, Climate Change, Economic Growth, Environmental Disclosures, Consumes, Corporate Governance, Eco-Innovation, Resource-Based View, Corporate Social Responsibility.

Appendix 3: SciMAT-generated cluster network



Note: Cluster network for *Sustainability* motor theme in period 2 (2004-2008) showing its associated sub-themes.

Appendix 4: Classifications of top 10 cited articles in each motor theme per period

Table 1. Journal field classification of articles

	1994-2003	2004-2008	2009-2013	2014-2017	2018-2021
General & Strategy	60%	50%	53%	35%	22%
Economics	24%	12%	1%	2%	5%
Marketing	10%	6%	15%	14%	12%
Innovation	4%	0%	0%	5%	25%
OS/OB,HRM/IR	2%	26%	26%	27%	33%
International Business	0%	4%	4%	2%	0%
Entrepreneurship	0%	2%	1%	6%	1%
OR,MS,POM	0%	0%	0%	9%	1%
	100%	100%	100%	100%	100%

Note: Based on the Harzing journal classification

Table 2. Unit of analysis

	1994-2003	2004-2008	2009-2013	2014-2017	2018-2021
Individual (Consumer/ Household)	8%	6%	16%	18%	8%
Firm	74%	76%	49%	56%	76%
Industry	6%	4%	0%	2%	0%
Business Unit	0%	0%	0%	1%	0%
Facility (Factory/Plant)	4%	6%	3%	0%	0%
Country	4%	2%	1%	0%	8%
Community	2%	0%	0%	1%	0%
Article (Literature Review)	2%	6%	30%	20%	9%
Regulation (Standards/Ecolabel/Practice)	0%	0%	1%	2%	0%
	100%	100%	100%	100%	100%

Table 3. Categorization of articles based on primary methodology

Column1	1994-2003	2004-2008	2009-2013	2014-2017	2018-2021
Experimental	6%	0%	4%	1%	0%
Quantitative – secondary data	36%	34%	14%	42%	59%
Quantitative – survey data	20%	8%	23%	13%	23%
Theory/conceptual	18%	22%	29%	22%	6%
Qualitative	12%	22%	8%	7%	4%
Review paper	8%	14%	24%	14%	9%
	100%	100%	100%	100%	100%

Appendix 5: List of top 10 articles from each of the motor themes

- Adams, R., Jeanrenaud, S., Bessant, J., Denyer, D., & Overy, P. (2016). Sustainability-oriented innovation: A systematic review. *International Journal of Management Reviews*, 18(2), 180-205.
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