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Johansson Mignon, I., Bankel, A. (2023). Sustainable business models and innovation strategies to realize them: A review of 87 empirical cases. *Business Strategy and the Environment*, 32(4): 1357-1372. <http://dx.doi.org/10.1002/bse.3192>

N.B. When citing this work, cite the original published paper.

RESEARCH ARTICLE



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Sustainable business models and innovation strategies to realize them: A review of 87 empirical cases

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Funding information

Swedish Energy Agency, Grant/Award
Number: P48527-1

Abstract

The importance of developing sustainable business models has recently received increased interest in society and among scholars. While firms attempt to innovate their business models towards sustainability or create new businesses to address sustainability issues, it becomes clear that there is no one-size-fits-all model when it comes to sustainable business models. Consequently, firms often struggle to identify, develop, and implement sustainable business models that suit them. This paper aims to address this problem by drawing on the wealth of recently published empirical studies and reviewing 87 cases where firms have performed business model innovation to achieve sustainable business models. Four main sustainable business models are identified that have been achieved through different business model innovation strategies. The review contributes to managers by offering a portfolio of strategies to achieve sustainable business models and to research by clarifying the relation between the business model innovation and sustainable business model concepts.

KEYWORDS

boundary spanning, business model, experimentation, innovation, strategy, sustainability

1 | INTRODUCTION

Over the past decades, tremendous efforts have been devoted to finding new ways to develop innovations, including technologies, products, and services, contributing towards slowing down climate change and increasing social welfare. Recently, the importance of developing sustainable business models (SBMs) has also received increasing interest in society. SBMs are based on a triple bottom line approach and consider a wide range of stakeholder interests, including environment and society (Evans et al., 2017). As such, they are a way for companies to embed sustainability into the business purpose

and processes and serve as a key driver of competitive advantage (Bocken et al., 2014). Firms try to adapt their business models (BMs) towards sustainability, new firms emerge with the mission to solve sustainability problems, and policymakers launch new policies to encourage market diffusion of SBMs.

These changes in strategies and policies have not gone unnoticed by scholars. In the last decade, research and scientific articles on SBM have increased drastically. Conceptual papers and literature reviews attempting to organize this new knowledge have provided a better understanding of what the concept mean and how to categorize different SBMs (e.g., Bocken et al., 2014; Boons & Lüdeke-Freund, 2013; Lüdeke-Freund et al., 2018; Schaltegger et al., 2012). These studies have shown that there is a great variety of SBMs and that different SBMs have distinct benefits and trade-offs (Reim et al., 2021).

List of Abbreviations: BM, Business model; BMI, Business model innovation; ICT, Information and communications technology; NGO, Non-governmental organization; PSS, Product-service-system; SBM, Sustainable business model.

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While the existing typologies are rather complex (i.e., with sometimes up to 11 different types of SBMs, e.g., in Bocken et al., 2014), and while it is sometimes difficult to differentiate between the BM types within typologies, what is clear is that there is no one-size-fits-all model when it comes to SBMs (Reim et al., 2021). As a consequence, it is difficult to find and develop an SBM that is well suited for the firm's prevailing situation (Reim et al., 2021). Additionally, it is realistic to assume that some SBMs are more difficult for firms to develop than others. SBMs require business model innovation (BMI), i.e., either through the transformation from one BM to another or the creation of entirely new BMs (Chesbrough, 2010; Osterwalder & Pigneur, 2010). In any case, it requires that a firm and its stakeholders undergo a paradigm shift from doing "business as usual" to balancing economic, environmental, and societal interests. Unfortunately, firms often lack the capabilities needed to identify, select, develop, and implement new BMs (Schaltegger et al., 2012).

To handle such challenge, firms can adopt a variety of strategies. In particular, boundary spanning, experimentation, practical tools, and guidelines for BM design and corporate management methods can facilitate BMI and the success of SBMs (Boons & Lüdeke-Freund, 2013; Brehmer et al., 2018; Matos & Silvestre, 2013; Sousa-Zomer & Cauchick-Miguel, 2019). For instance, through experimentation, firms can test new SBMs quicker to learn about their weaknesses and make the necessary adjustments (Evans et al., 2017). Likewise through the use of practical tools and guidelines, firms can increase their understanding of the BM concept and receive support in identifying areas of improvement (Silvestre et al., 2022).

Although SBMs have received much attention in recent years, and while business sustainability is more important than ever, the concept of SBM and the process to achieve SBMs are still poorly understood (Laukkanen & Patala, 2014). For instance, mechanisms for experimentation or boundary spanning among stakeholders involved in creating SBMs are still to be identified and understood (Schaltegger et al., 2016). SBMs are also far from being the norm in most industrial settings (Reim et al., 2021). To sum up, firms need recommendations and support in transforming their BMs to become more sustainable or to create completely new SBMs and how to implement these SBMs. In this paper, we take the opportunity to draw on the increasing wealth of recently developed case materials to perform a review of empirical cases where firms have performed BMI in order to achieve SBMs. We surveyed and reviewed 87 unique empirical cases of BMI towards SBM published in previous case studies. The two research questions driving our study are as follows: (1) What are the main SBMs described empirically in the literature and what are their particularities? (2) What are the strategies used by firms to develop and implement SBMs?

2 | THEORETICAL FRAMEWORK

2.1 | Sustainable business models

Although developing at a rapid pace, the SBM literature is still in its infancy phase (Dentchev et al., 2018). This means that it grows quickly

but that the current knowledge is rather unorganized (Lüdeke-Freund et al., 2018). Inconsistencies in the SBM literature have been observed which is not surprising, given that SBM scholars come from different traditions and have different frames of references (e.g., from the management and strategy literature, entrepreneurship, sociology, environmental sciences, or natural sciences) (Dentchev et al., 2018; Lozano, 2018; Lüdeke-Freund et al., 2018).

Despite some persisting unclarities in the literature, authors agree that an SBM (1) requires a holistic view on value (i.e., not only economic but also environmental and social values), (2) include a broader scope of stakeholders, and (3) has a long-term perspective (Boons & Lüdeke-Freund, 2013; Lozano, 2018; Stubbs & Cocklin, 2008). As a way to contribute to increased theoretical and empirical understanding of the variety of existing SBMs, several authors have developed SBM categorizations and typologies.

The archetype categorization developed by Bocken et al. (2014) is probably the most cited categorization of SBMs and has attempted to inspire firms that want to integrate sustainability in their existing BMs. The authors identified eight SBM archetypes: "maximize material and energy efficiency," "create value from waste," "substitute with renewables and natural processes," "deliver functionality rather than ownership," "adopt a stewardship role," "encourage efficiency," "repurpose for society/environment," and "develop scale up solutions" and showed that SBMs can have different focus. Apart from Bocken et al. (2014), Lüdeke-Freund et al. (2018) have also developed a taxonomy of 11 pattern groups of SBM. This taxonomy includes SBMs grouped based on price and revenue patterns (e.g., subscriptions), financing patterns (e.g., crowdfunding), eco-design patterns (e.g., product design), closing-the-loop patterns (e.g., industrial symbiosis), supply chain patterns (e.g., green supply chain management), giving patterns (e.g., "buy one, give one"), access provision patterns (e.g., building a marketplace), social mission patterns (e.g., market-oriented social mission), service and performance patterns (e.g., result-oriented services), cooperative patterns (e.g., cooperative ownership), and community platform patterns (e.g., sharing business). Schaltegger et al. (2012) identified six main case business case drivers differentiating SBMs: SBMs driven by costs and cost reduction, risk and risk reduction, sales and profit margin, reputation and brand value, attractiveness as employer, and by innovative capabilities.

Some authors have also developed specific SBM typologies focusing on, e.g., product-service-system (PSS) or circular BMs. For instance, already in 2004, Tukker (2004) developed a typology of PSS based on their product, use, or result orientation. This resulted in eight types of services, namely, (1) product-related service, (2) advice and consultancy, (3) product lease, (4) product renting or sharing, (5) product pooling, (6) activity management/outsourcing, (7) pay per service unit, and (8) functional result. Henry et al. (2020) instead focused on a typology of circular BMs, which they base on the strategy of the BM and the type of innovation the BM relies on. The result is six circular BM types, namely, (1) design based, (2) waste based, (3) platform based, (4) service based, (5) nature based, and (6) other circular BMs.

Clearly, the growing SBM literature indicates that many different types of SBM exist and that different SBMs serve firms in different

ways. However, the problem is that the existing typologies are rather complex, and it is sometimes difficult to differentiate between the BM types within typologies. For instance, it may be difficult to distinguish between SBMs with “social mission patterns” and “giving patterns” as categorized by Lüdeke-Freund et al. (2018) or between SBMs based on “maximize material and energy efficiency” and “encourage efficiency” in Bocken et al. (2014). There is a need to simplify categorizations so that firms are able to choose the direction of their SBMs cautiously, considering the pros and cons of different SBMs and how well they match with their context and ambitions.

2.2 | Strategies for BM innovation towards sustainability

Firms often struggle to identify, select, develop, and implement new BMs, especially towards sustainability, since SBMs often require changes in the existing BM, in the firm's corporate culture, and can trigger tensions within the organization (Porter & Derry, 2012; Silvestre et al., 2022). As a way to handle such process, firms need to develop strategic plans and processes to both perform BMI and implement new SBMs within the organization.

Previous research on BMI has underlined various strategies for innovating BMs. Among these, organizational leadership, in particular change leadership, has been highlighted by several authors (Chesbrough, 2010; Smith et al., 2010). BMI implies changes in some components of the BM, and, without clear leadership directions, there is a risk of inertia arising from the organization as a defense mechanisms against these changes (Chesbrough, 2010; Doz & Kosonen, 2010).

When it is unclear how the market and stakeholders may react to a new BM, it is important that firms dare experimenting (Chesbrough, 2010; McGrath, 2010; Sosna et al., 2010). This strategy implies that a BM is not static and that it continuously requires adjustments to follow the evolution of the firm, customer demands, and the external environment, etc. Under such conditions, firms can use experimentation and learning through trial and error to discover and exploit new BMs (McGrath, 2010; Sosna et al., 2010). Experimental actions lead to the collection and generation of new information that is needed to objectively evaluate and choose new BMs (Chesbrough, 2010).

Some authors have also proposed the use of practitioner-oriented tools as a strategy for facilitating the process of conducting BMI (e.g., Amit & Zott, 2020; Deshler & Smith, 2011; Evans & Johnson, 2013). These tools can, for instance, provide methods for firms to better understand their current BM (e.g., Osterwalder & Pigneur, 2010), help generate ideas (e.g., Eppler et al., 2011), or support BMI in each phase of the process (i.e., initiation, ideation, integration, and implementation) (e.g., Remane et al., 2017).

The growing literature on SBMs has also highlighted BMI strategies. For instance, similar to the BMI literature, several authors have suggested that experimentation is a key strategy for learning about

BMs, to discover new BMs and improve or adapt BMs towards sustainability (Evans et al., 2017). Experimentation is seen as key for firms to develop capabilities needed for transitioning to sustainable business practices and to test assumptions about SBMs in a rapid and cost-effective way (Aagaard et al., 2021; Bocken et al., 2019). Likewise, researchers and practitioners have developed numerous practical tools to support the process of strategically integrating sustainability into BMs (Silvestre et al., 2022). These tools can support firms in, e.g., understanding their current BMs, analyzing the value captured and uncaptured in the current BM for key stakeholders across the product life cycle, and prioritizing between alternative SBMs (see the comprehensive review of these tools and their objectives by Silvestre et al., 2022).

Finally, boundary spanning has also been emphasized as one of the recurrent strategies for firms that want to develop and implement SBMs. Boundary spanning is based on the perspective that when integrating sustainability into their BM, firms must consider a broader view on their activities and the positive or negative consequences of these activities on a variety of stakeholders (Brehmer et al., 2018; Stubbs & Cocklin, 2008). Using boundary spanning as a strategy for achieving SBMs is a way to change the traditional power structures that commonly characterize BMs, e.g., by sharing assets or redistributing value captured in the supply chain (Brehmer et al., 2018; Brennan & Tennant, 2018). Studies have shown that by innovating towards SBMs through boundary spanning, firms can achieve economic benefits and mitigate environmental effects and realize social benefits (Sousa-Zomer & Cauchick-Miguel, 2019).

3 | METHOD

3.1 | Research design and data collection

To explore the most recurrent SBMs and firms' strategies to develop and implement SBMs, we surveyed and reviewed 87 unique cases of BMI towards SBM published in previous academic studies during the period 2010–2020. The choice of this method was made to draw on the rich empirical data that have been collected and analyzed in the SBM literature over the last 10 years. In qualitative research, it is often difficult to gather data over a long period of time, focusing on different aspects or perspectives of the studied phenomenon and covering organizations from a variety of industries, of different sizes and with different strategies and BMs. Surveying previous empirical cases allows to build on previous empirical research, e.g., by broadening the scope and context of previous empirical cases and hence contributing with a more comprehensive and stronger picture based on many studies and settings (Gough et al., 2017). It can be used as a way to reconcile the evidence to better inform policy and practice (Petticrew & Roberts, 2008), for instance, by extracting trends, patterns, relationships, and the overall picture from previous studies (Borrego et al., 2014).

The review was informed by Petticrew and Roberts (2008) and carried out in three steps (I–III).

Step I involved searching the Web of Science for the selected publication period, using the search terms “sustainable business model” OR “sustainable business models” as title or topic keyword. Since it was of interest to understand how firms innovate in the design of the BM towards sustainability, these keywords were combined with (i.e., AND) “business model innovation” as title keywords. This search yielded a result of 312 articles, proceedings papers and reviews. The titles and abstracts of these papers were screened (Step II) based on the inclusion of the terms “business model innovation” and “sustainable business model(s)”, or a variation thereof (e.g., BMI for sustainability). The screening resulted in an initial selection of 49 articles. In Step III, we reviewed the full papers and created a database where information regarding, e.g., the article's definition¹ of BMI and SBM as well as the empirical case description(s) was included for each article. In the articles, the case data were collected and analyzed according case study methodology developed by, e.g., Yin (1994) and Eisenhardt (1989). In other words, this means that in the articles, the cases aimed as illustrating and explaining a specific phenomenon in its context (Yin, 1994).

As a result of Step III, papers lacking empirical cases or case descriptions were omitted, as were papers that only used the BMI and SBM concepts in passing and those that equate sustainability to viability (since the paper focuses on BMs that contribute to coping with global change and social injustice, rather than BMs that primarily aim to make organizations viable). This resulted in a final database of 25 articles describing a total of 87 unique cases (see Table A1).

3.2 | Data analysis

The analysis was also carried out in three steps (IV–VI). In Step IV, each author reviewed the selected articles again in full, looking for emerging patterns specifically focused on BMI and SBM. By comparing and discussing the authors' individual findings, two reoccurring themes could be identified: recurrent SBM types (Section 3.4) and various strategies to develop and implement SBMs (Section 3.5).

After reviewing extant literature on SBM, the authors were aware that BMs seemed to display differences in terms of outputs (Section 2.1) and wanted to explore if such patterns could be distinguished in the selected empirical cases (Step V). Likewise, the authors wanted to explore the different strategies used by firms to develop and implement their SBMs (Step VI).

In Step V, the authors first categorized the cases independently, then discussed them, and adjusted the categorization based on their understanding. Once a common understanding was developed, one of the authors completed the categorization, and the other checked it for consistency. The authors were unable to categorize some cases, either because the articles lacked details or explanations to help the reader understand how or why the BM was considered sustainable (e.g., Hu et al., 2019; Ulvenblad et al., 2019) or because the BMs were not claimed to be sustainable² (e.g., Björklund, 2018; Joyce & Paquin, 2016; Morioka et al., 2016). A few cases also matched several SBM categories (e.g., Gallo et al., 2018) but had a stronger match with

one of the categories and were, therefore, categorized according to the SBM type it resembled most. A total of 72 cases in 19 articles could be categorized according to patterns related to SBM output.

When it comes to strategies (Step VI), the analysis took its starting point in the previous literature as described in Section 2.2. We compared the strategies described in the previously literature with the strategies to develop and implement new SBMs described in the reviewed cases. During this process, we were open for the emergence of new strategies. For some cases, the authors could not distinguish which strategies had been used due to lack of information provided in the case descriptions (e.g., Tolkamp et al., 2018; Yang et al., 2017) or due to the fact that the article did not explain or focus on the process used to select, develop, and implement the SBM (e.g., Björklund, 2018; Morioka et al., 2016; Prendeville & Bocken, 2017). Fifty-nine cases in 19 articles displayed patterns related to strategies for developing and implementing SBMs. Review of empirical cases in SBM literature.

3.3 | Descriptive analysis

This section presents a descriptive analysis of the cases reviewed in this paper. The selected articles have been published in a wide range of journals: 12 in total. The most prevalent outlet was *Journal of Cleaner Production* (11). As described in Section 3.1, the literature search was focused on the publication period 2010–2020. Within this period, most of the articles were published from 2017 to 2019. A complete list of articles and journals is available in Table A1.

Based on the articles included in the study, 87 unique cases that were used to illustrate or analyze BMs and SBMs were identified.³ These cases mainly focus on firms located in Europe (44), particularly in countries such as the Netherlands (27), Sweden (12), and the UK (8), as well as Asia (7), primarily in China (5). The cases cover different industries, including manufacturing (13), agriculture (10), fashion (8), food (8), energy (6), and construction (5). A complete list of cases is available in Table A1.

3.4 | Recurrent SBM types

In the reviewed cases, four different types of SBMs could be distinguished. These BMs are considered sustainable because, compared to traditional BMs, they either (1) imply improvements towards efficiency, (2) are based on new ways to make the business sustainable, (3) have a stronger orientation towards society and/or the environment, or (4) are “born sustainable.”

Firms with SBMs that imply *improvements towards efficiency* make efforts to reduce their negative impact on the environment either by minimizing consumption and waste in their production (e.g., Short et al., 2014) or delivery processes (e.g., British Telecom in Prendeville & Bocken, 2017), or by increasing the use of renewables (e.g., Khripko et al., 2017). Firms with solutions that enable

sustainability measures also have this type of SBMs. Examples include the firm Woonconnect (Tolkamp et al., 2018) that provides an online tool to configure energy efficiency products in customers' homes and the micro ICT firm in Heyes et al. (2018) that offers data monitoring and analysis of customers energy usage.

The second SBM type consists of BMs that are based on *new ways to make business sustainable*. Firms with this type of SBM often transform their BMs from selling a product to offering it as a service (e.g., selling lighting as a service like Aura Light; França et al., 2017). There are also examples of start-ups creating new BMs around this concept, e.g., providing clean clothes on a pay-per-wash basis—Bundles (Prendeville & Bocken, 2017) and HOMIE (Bocken et al., 2019). This type of SBM also include various sharing platforms that strive to promote a more efficient use of products and reduce overconsumption/overproduction, e.g., bike-sharing (e.g., Sousa-Zomer & Cauchick-Miguel, 2019), car-sharing (e.g., Ciulli & Kolk, 2019), and sharing platforms for machinery, supplies, and tools (e.g., Ciulli & Kolk, 2019). BMs that focus on product life extension and slow fashion are also included in this SBM type, e.g., the apparel firm Nudie Jeans (Prendeville & Bocken, 2017) that supports upcycling and recycling of old jeans and offers free repairs.

Several cases in the review include BMs that are based on a *stronger orientation towards society and/or the environment*. These SBMs promote closer collaboration and consideration of stakeholders by investing in supplier relationships through education (e.g., TCHO in Gallo et al., 2018) or long-term agreements (e.g., Brennan & Tennant, 2018) or by forming new partnerships to address sustainability issues (e.g., Philips and New Karolinska Hospital; Velter et al., 2020). This SBM type also includes BMs that enable a fairer distribution of wealth among stakeholders and increase investments in local communities through various shared ownership structures, e.g., Divine Chocolate (Gallo et al., 2018) or FSB bank (Stubbs, 2019).

The final SBM type consists of BMs that are *born sustainable*, i.e., firms that are created with the main ambition to solve a sustainability issue and create value for the environment and/or society. A prominent example of this SBM type is the social enterprise that strives to use its economic gains to achieve a social and/or environmental goal, e.g., Cafédirect (Davies & Doherty, 2019) and Favalley (Geissdoerfer et al., 2017). BMs that are built around sustainability also fall under this type of SBM, such as the pizzeria in Franceschelli et al. (2018) that considers sustainability in all aspects of its business, from only using sustainably sourced ingredients and biodegradable disposables, to partnering up with couriers using bicycles and electric vehicles. Velter et al. (2020) also describe the case of Futureproof, a firm that replaces harmful asbestos roofs and provide insulation and solar panels in a cost-neutral way (using solar as the source of finance). Finally, the service concept THANKS (described in no less than three articles) aims to encourage energy saving behavior at workplaces by triggering office workers to make small donations to NGOs with company money every time they complete a sustainable action (Baldassarre et al., 2017; Bocken et al., 2019; Schuit et al., 2017).

3.5 | Strategies to develop and implement SBMs

In the review of empirical cases illustrating BMI towards SBMs, a pattern of strategies to achieve BMI was identified. More specifically, cases show that firms mainly use boundary spanning and experimentation as strategies to innovate their BMs. Additionally, they use practical tools aimed at, for instance, better understanding their current BM and its limitation, as well as corporate management methods aimed at facilitating the acceptance of the BMI process and implementation within the organization. In general, it should be noted that boundary spanning is the most recurrent strategy when it comes to innovating BMs towards SBMs (i.e., the other strategies are used for BMI in general, without necessarily having a clear sustainability focus). Moreover, it appears that most of the strategies for BMI are used together with an experimentation strategy, hence making experimentation a key ingredient to any BMI process. Finally, in the current state of the literature, the process of BMI is often not described thoroughly. Instead, it is common that authors focus on describing the output of BMI (i.e., the SBM) rather than the mechanisms and potential challenges that took place during the innovation process. A complete list of the findings is available in the appendix.

3.5.1 | BMI through boundary spanning

Several of the reviewed cases point to key changes in the BM that increase the sustainable dimension through broadening the boundaries of the focal firm and its customers in a way that ensures a better distribution of power and value among stakeholders. Such changes differ in terms of the way in which value is created/captured beyond firm boundaries, which actors are involved, and firms' motives for engaging in the boundary spanning activities. Five different boundary spanning mechanisms could be differentiated: shared ownership, education, long-term agreement, partnership, and sharing platform.

Firms with the *shared ownership* mechanism establish ownership structures that enable a greater distribution of value captured among its stakeholders. Among the cases, this ownership structure was predominately found in the agriculture industry where farm-cooperatives hold the majority of company shares (e.g., British bean-to-bar chocolate firm Divine Chocolate, whose largest shareholder is the Ghanaian cooperative farmers' union Kuapa Kokoo; Gallo et al., 2018). Shared ownership provides farmers with greater wealth accumulation and influence to invest in their local communities. Such cases were also found in the banking industry, such as the case of FSB bank (Stubbs, 2019). In this case, FSB targets the non-profit sector, and 50% of the bank is owned by a group of non-profit organizations (i.e., customers) whose aim is to increase the sector's access to capital.

The *education* mechanism implies that firms invest in a community or its suppliers through education. Most of the reviewed cases with this mechanism were non-profit organizations or social enterprises whose primary objective is to maximize benefits for the society and/or the environment. The UK-based social startup Favalley, for instance, provides a free tutored coding course for youths living in the

slums and subsequently act as a recruitment agency by matching the youths with hiring firms (Geissdoerfer et al., 2017). Some for-profit firms were also found in the review, such as the chocolate firm TCHO that continuously shares expertise with its cocoa bean suppliers through specifically developed educational tools, aiming to reduce the negative environmental impact of their processes (Gallo et al., 2018). Notably, TCHO does not demand exclusivity for its educational tools and, thereby, enable cocoa farmers to use the tools to optimize their harvesting and fermentation processes for other buyers as well.

Some firms also go against industry norms and form *long-term agreements* with their suppliers to create win-win situations (as opposed to transactional dominance). For instance, Adnamns brewery decided to relinquish some of its negotiation power in order to establish a contractual link with its suppliers (Brennan & Tennant, 2018). Adnamns realized that by sharing more value captured with its suppliers through a long-term agreement, the firm could secure its supply and increase its influence over suppliers' environmental practices (Brennan & Tennant, 2018).

The *partnership* mechanism resembles the long-term agreement mechanism in terms of its collaborative approach. The difference between the two mechanisms is that long-term agreements are formed with firms' existing suppliers, whereas partnerships are formed with new actors that are not part of their existing supply networks. Case examples of partnerships include joint ventures, alliances with NGOs, and partnerships between firms and their users (e.g., the healthcare equipment manufacturer Royal Philips and New Karolinska hospital; Velter et al., 2020). Notably, all identified partnerships in the review were formed by at least one established firm.

Many cases also exemplify boundary spanning value creation and/or capture through *sharing platforms* that facilitate exchange of goods and services between external actors.⁴ Two sharing platform mechanisms could be distinguished from the review: peer-to-peer sharing, and business-to-business sharing. Firms with peer-to-peer sharing platforms enable value creation and capture among different actors by facilitating the exchange of goods, services, or favors, between peers in a community. The startup Peerby, for instance, aims to offer an alternative to excessive consumption through a sharing platform that enables neighbors to rent or borrow goods from each other (Schuit et al., 2017). Business-to-business sharing platforms, instead, target businesses and professionals, such as Sheke Network (SKN) that facilitates recruitment matching between architectural designers and architectural institutes⁵ (Hu et al., 2019).

3.5.2 | BMI through experimentation

Experimentation was the most common strategy used by firms to innovate their BM. Yet, in contrast with boundary spanning, which aims at innovating the BM to make it more sustainable, experimentation is used as a part of the general BMI process. It is also interesting to note that experimentation is often combined with other strategies, e.g., boundary spanning and the use of practical tools and guidelines

(e.g., Baldassarre et al., 2017; Davies & Doherty, 2019; Gallo et al., 2018; Short et al., 2014).

On a general level, organizations using an experimentation strategy have in common that they are open for failure and for the need of continuous adjustments in their BMs. They see the BMI process as an opportunity to learn. However, the review shows that firms use experimentation in different ways. In most cases, the firms experiment stepwise in the BMI process, e.g., by integrating new products, activities, or stakeholders, one step at the time, once the impact of the previous change is stabilized (Short et al., 2014; Ulvenblad et al., 2019). For instance, the case British Sugar went from offering sugar to offering a broad range of additional synergistic product lines, such as animal feed, electricity, tomatoes, and bioethanol. The firm divided this process into several investment phases; when one phase of the BMI, e.g., activities related to biofuel, was proven successful, the next investment phase was unlocked (Short et al., 2014).

Other firms instead have *iterative phases* in the process where adjustments in the BM occur (Baldassarre et al., 2017; Bocken et al., 2019; Geissdoerfer et al., 2017; Todeschini et al., 2017). One such example is the case of THANKS where the BMI process took place through three iterative phases: gathering internal inputs (through e.g., interviews, written employee feedbacks, observations, and brainstorming sessions), developing a digital prototype of the concept tested both internally and externally, and developing a physical prototype of the concept tested both internally and externally (Baldassarre et al., 2017; Bocken et al., 2019).

Experimentation can also take the form of *pilot projects and test groups*, where, e.g., new products or services are tested on user groups or where users are involved in defining new ideas to be incorporated in the new BM (Hu et al., 2019; Schuit et al., 2017; Tolkamp et al., 2018). Such experimentation usually goes hand in hand with the boundary spanning strategy, since several interests and stakeholders are involved in the experimentation process. For instance, THANKS worked on creating symbiotic relationships with users and the NGOs benefiting from the BM. To do so, they drove pilot projects and organized testing with these core stakeholders (Baldassarre et al., 2017; Bocken et al., 2019). The case of SKN (Hu et al., 2019) also illustrates how experimentation can take place through the testing of prototypes, especially when it comes to digital tools.

Some firms also experiment with *new organizational forms*. For instance, combining a boundary spanning strategy and an experimentation strategy for BMI towards sustainability, Grenada Chocolate Company decided to create a worker cooperative organization, although it was a disruptive organizational form in the chocolate industry and despite the fact that laws in Grenada did not recognize such organization form (Gallo et al., 2018). Likewise, Divine Chocolate developed a unique ownership structure set up through the creation of a cooperative farmers' union gathering over 45,000 members with the aim of empowering local farmers and of allowing for a greater distribution of the firm's wealth (Gallo et al., 2018).

Finally, in some reviewed cases, experimentation with *new materials, technologies, or processes* are underlined (Gallo et al., 2018; Khripko et al., 2017; Velter et al., 2020). Our cases include examples

from the fashion industry, including Orange Fiber (reusing material from citrus juice byproducts), Revoada (manufacturing backpacks, wallets, and briefcases using inner tubes of large vehicle tires), and Preza (transforming industrial waste from the local luxury furniture industry into high-end fashion accessories) as well as from the construction industry, e.g., Thuisbaas and Ecor Circular Friesland which applies non-toxic mono-material cellulose fiber production using local waste streams (Todeschini et al., 2017; Velter et al., 2020). As far as technologies and processes are concerned, the example of TCHO is illustrative as the firm's focus on technology and process experimentation is present in all aspects of stakeholder relationships (unique mobile phone applications for customers, improved production facilities, and collaboration with cacao farmers to introduce technologies that improve bean quality) (Gallo et al., 2018).

3.5.3 | BMI through the use of practical tools and guidelines

To a lower extent than boundary spanning and experimentation, firms were found to use some practical tools and guidelines as a strategy for BMI. These tools and guidelines have been specifically designed for the purpose of supporting firms innovating their BMs towards sustainability. Some examples include the Cambridge Business Model Innovation Process, which is a framework developed to guide organizations' BMI efforts and map the necessary activities and potential challenges (Geissdoerfer et al., 2017), and the Triple Layer Business Model Canvas, which is based on the Business Model Canvas developed by Osterwalder and Pigneur (2010) with an added environmental layer based on a lifecycle perspective and a social layer based on a stakeholder perspective (Joyce & Paquin, 2016). The social start-up Favalley has, for instance, since its start been using the Cambridge Business Model Innovation Process as a support for BMI. The process started with the first three phases of the framework: (1) ideation, (2) concept design, and (3) virtual prototyping, and was, at the time of the paper publication, moving forward to the implementation stages, including seed fundraising, before elaborating the conceptual details further and starting the experimentation phase. In a similar fashion, at THANKS, managers were provided with a *Sustainable Value Proposition Design methodology* aimed at mapping and understanding stakeholders in a broad sense, identifying their needs and interests, and progressively combining them into value proposition (Baldassarre et al., 2017). Through iterative phases of talking, thinking, and testing together with key stakeholders, the start-up was able to develop a sustainable value proposition and a superior problem-solution fit.

3.5.4 | BMI through corporate management

In a few cases (i.e., British Sugar, Companies A & B, Food-for-Feed-for-food, THANKS, CaféDirect, and Grenada Chocolate Company), the importance of corporate management was underlined for both the creation of a new SBM as well as its long-time implementation.

Indeed, changing the core values and mechanisms for capturing value is not an easy undertaking for most firms. The case of CaféDirect and, in particular, the tensions that emerged when the firm went from a straightforward contingent model of donating money to actively managing the commercial interests of the firm are illustrative of the importance of having a corporate management strategy when making changes in the BM (Davies & Doherty, 2019). Hence, several cases stress the importance of *creating a new vision* and new ways of prioritizing as a way to show commitment from managers (e.g., Gallo et al., 2018; Ulvenblad et al., 2019). *Leading-by-example* is another example described in the case of Grenada Chocolate Company, where the managers did not only preach for an SBM but also took managerial decisions in line with that path, e.g., by installing solar panels and seeking renewable modes of shipping products (Gallo et al., 2018). Likewise, as a way to induce a cultural shift within the organization and in the industry, British Sugar and THANKS made a point of *involving employees*⁶ into the creation of the new SBM; employees were invited to come with suggestions to reduce waste, to create value from waste, and to create incitement for waste reduction (Bocken et al., 2019; Short et al., 2014).

4 | DISCUSSION

One of the objectives of reviewing empirical cases was to explore patterns of SBMs. This was driven by the need to simplify previously developed categorizations (e.g., Bocken et al., 2014) in order to better grasp the core sustainability focus of SBMs. By reviewing 87 cases of firms in various contexts and with different organizational forms, we found that four different types of SBMs could be distinguished. These BMs are considered sustainable because, compared to traditional BMs, they either (1) imply improvements towards efficiency, (2) are based on new ways to make the business sustainable, (3) have a stronger orientation towards society and/or the environment, or (4) are born sustainable.

The case review also indicates some clear connections between the concepts of BMI and SBM. As earlier indicated by, e.g., Schaltegger et al. (2012) and Geissdoerfer et al. (2018), our review shows that firms have different strategies to innovate towards SBMs. In particular, firms use boundary spanning, experimentation, practical tools and guidelines, and corporate management strategies. Usually, firms also combine different BMI strategies, especially experimentation and boundary spanning. In a context of BMI towards sustainability, this seems rather logical since experimentation is a common strategy to achieve BMI in general (e.g., Bojovic et al., 2018), while boundary spanning is a strategy that has clear sustainability motives (Brehmer et al., 2018).

As previous literature on SBM has underlined, innovation aimed at achieving sustainability is not a process that happens in isolation (Boons & Lüdeke-Freund, 2013; Brehmer et al., 2018). As our results indicate, boundary spanning is a strategy used when firms have the ambition and vision to share their influence and wealth with other stakeholders, to educate communities, to establish long-term balanced

relationships, and/or to share resources among a larger group of stakeholders. In this review, a pattern of mechanisms for boundary spanning value creation/capture was identified that also relates to different types of SBMs. In particular, firms with *stronger orientation towards society and/or the environment* use a variety of boundary spanning strategies, including partnerships, shared ownership, education, and long-term agreements. This makes sense since the purpose of these SBMs is to expand traditional BM boundaries so that other stakeholders can share the benefits of the business activities.

Interestingly, some cases highlighted BMI where different organizations partnered up to co-create BMs, e.g., BMW and Sixt (in Ciulli & Kolk, 2019) or DSM and Niaga (in Velter et al., 2020). By bringing their complementary capabilities together, these firms strived for both innovation and sustainability in their BMs. However, it is difficult to determine if the intent for incumbent firms to enter these partnerships was to promote greater consideration of stakeholders or if the primary objective was to grow the business through BMI. It can thus be questioned whether the impact on sustainability of these new BMs is positive, or if co-creation is simply used as a selling point for a BMI initiative that might in fact have a negative overall effect on sustainability (Ciulli & Kolk, 2019). Either way, it is interesting to note that the findings show that co-creation of BMs is more often performed through partnerships than, e.g., acquisition.

A final pattern that exceeds the concepts of BMI and SBM relates to the type of firms that adopt different SBM types. The findings reveal that established firms are overrepresented among firms with SBMs of the type *improvements towards efficiency* and *stronger orientation towards society and/or the environment*. In contrast, start-ups are more prevalent among firms with SBMs of the type *born sustainable*. The SBM type *new ways of making business sustainable* was found among both established firms and start-ups. The findings are in line with, e.g., Aragón-Correa et al. (2008) and Bos-Brouwers (2010), who underlined that established firms are less flexible to BM changes than other firms. Nevertheless, the patterns found in the reviewed cases suggest that established firms do not only base their strategies on easily achieved SBMs or defensive approaches. Indeed, some established firms with SBMs of the type *new ways of making business sustainable* (e.g., Aura Light or Nudie Jeans) radically broke with the traditional way of doing business to achieve and integrate sustainability in their BMs.

4.1 | Implications for managers/practitioners

The study's findings have several implications that are of relevance for managers. To start with, the simplified differentiation between SBMs has the potential to facilitate the creation of a vision for developing an SBM. Managers may find the simpler categorization easier to grasp when establishing and communicating a sustainability ambition or vision for their firm, e.g., "due to our current financial situation our first step towards an SBM will be to make *improvements towards efficiency*."

The paper also contributes to managers by reviewing strategies to perform BMI, particularly towards SBMs. The portfolio of strategies to develop and implement SBMs introduced in Section 3.5 can especially facilitate the process of BMI for managers, depending on their context. This is relevant, since our analysis of empirical cases confirms that, while BMI and SBM are often associated, they are two distinct concepts that require different goals and capabilities (Inigo et al., 2017; Pedersen et al., 2018).

The results also indicate that some BMI strategies are better suited for some SBM types. For instance, boundary spanning strategies are particularly important to achieve SBMs with *stronger orientation towards society and/or the environment*. Likewise, corporate management strategies (e.g., leading by example, employee involvement, and creating a new vision) are particularly important for the SBM-type *new ways of making business sustainable* because it implies changes in the way of conducting business that can lead to major organizational changes and tensions. Managers that want to achieve SBMs should therefore consider two main aspects when (re)designing their BMs: (1) How anchored is the organization's existing BM? (2) What type of SBM does the organization aim to achieve? Based on the answers, the BMI strategy can then be chosen.

Another implication for both managers and policymakers is that different SBMs can have both positive and negative impact on sustainability. As highlighted by, e.g., Evans et al. (2017) and Ciulli and Kolk (2019), some SBMs can have a positive impact on the environment and at the same time have a negative impact on society and the economy. Likewise, strategies that may appear targeted at innovating an existing BM towards an SBM could in fact be entirely motivated by less sustainable objectives. Finally, while small changes in the BM (e.g., through improvements towards efficiency) can be considered as low hanging fruits (Schaltegger et al., 2012), they may be very positive in term of CO² emissions, depending on, e.g., the size of the firm or its environmental or social impact. In contrast, radical changes in a firm's BM may be ground-breaking for an industry, but it may have a small overall impact on sustainability due to the firm's lack of viability.

4.2 | Implications for future research

In line with previous reviews and conceptual papers on SBMs (e.g., Dentchev et al., 2018; Lozano, 2018; Lüdeke-Freund et al., 2018), and despite the presence of typologies of SBMs, this paper's findings show that inconsistencies remain about what constitutes an SBM. In some papers, there is a mismatch between the definition of what characterizes an SBM put forward by the authors and the characteristics of the case(s) (e.g., Ciulli & Kolk, 2019; Prendeville & Bocken, 2017; Todeschini et al., 2017; Tolcamp et al., 2018). There are also papers, where the authors do not provide a clear motivation on why the BM is sustainable (e.g., Hu et al., 2019; Ulvenblad et al., 2019). As stated by Foss and Saebi (2017), such inconsistencies and ambiguity hinder the cumulativeness of the research of SBM, since it reduces the possibility to compare cases of

SBMs with each other and to build further on these comparisons or patterns. Since the degree of sustainability of BMs can vary greatly (Evans et al., 2017), it is problematic to include them under the SBM-umbrella without further distinction.

The review revealed that an additional source of unclarity emerges from the mix and integration of the BMI and SBM concepts. For instance, several authors take for granted either the sustainability dimension of BMIs (e.g., Brennan & Tennant, 2018; Hu et al., 2019) or the innovation dimension of SBMs (e.g., Heyes et al., 2018). Since our findings show that many general BMI strategies like experimentation (e.g., Chesbrough, 2010) were used to also achieve SBMs, such confusion may not come as a surprise. However, it may be problematic if any BMI with weak ties to sustainability is assumed to result in an SBM since it discourages firms to pursue more ambitious undertakings. Likewise, as Boons and Lüdeke-Freund (2013) put it, any SBM, by nature, requires some type of adaptation at the level of the firm or its environment. Even the SBMs that are born sustainable (and do not need adaptation at the level of the firm) require changes in attitudes and values of how to conduct business (Stubbs & Cocklin, 2008). Yet sustainability can still be achieved through existing BMs, e.g., through the development (and sale) of sustainable innovations (e.g., Boons & Lüdeke-Freund, 2013).

The fact that some authors have started to integrate both concepts of BMI and SBM into the notion of SBMI (e.g., Baldassarre et al., 2017; Björklund, 2018; Bocken et al., 2019; Prendeville & Bocken, 2017; Schuit et al., 2017) also increases the risk of contributing to the ambiguity. We would argue that it is often unclear how this new notion adds clarity or new perspectives to the SBM literature. In most of the articles referring to the notion, it is rather difficult to understand how SBMI differs from SBM (e.g., Baldassarre et al., 2017; Björklund, 2018; Bocken et al., 2019; Prendeville & Bocken, 2017; Schuit et al., 2017). The main argument expressed in these studies is that SBM requires changes that are then expressed through BMI. Adding to the already ambiguous and unclear concepts of BMI and SBM should be done with caution at this stage. Here again, to avoid inconsistencies and vagueness, it should not be assumed that an SBM is automatically a BMI (or vice versa). BMI as a concept should also be used when it adds to the conceptual or empirical understanding of the case, not just as an add-on to SBM. As a matter of fact, some authors have been successful at doing so (França et al., 2017; Geissdoerfer et al., 2018). To build stringency in the debate, we recommend that future research on BMI and SBM is more specific regarding how BMI leads to SBMs.

5 | CONCLUSIONS

The aim of this paper was to contribute to a better understanding of how firms have performed BMI in order to achieve SBMs. Eighty-seven unique empirical cases of BMI towards SBMs were surveyed and reviewed to identify the main SBMs described empirically in previous studies and what strategies firms use to develop and implement these.

The review indicates that four types of SBMs have recurrently been studied in the literature: SBMs (1) that imply *improvements towards efficiency*, (2) are based on *new ways to make the business sustainable*, (3) that have a *stronger orientation towards society and/or the environment*, or (4) that are *born sustainable*.

With regard to strategies used to achieve SBM through BMI, our review also shows that four recurring strategies have been used in the reviewed cases: boundary spanning, experimentation, the use of practical tools and guidelines, and corporate management strategies. Each of these strategies includes a variety of approaches that can be used by firms and their managers. For instance, boundary spanning strategies can be used in the form of shared ownership, education, long-term agreements, partnerships, or sharing platforms. In most of the reviewed cases, firms chose to combine different BMI strategies where the most common combination was boundary spanning and experimentation.

It is interesting to note that some BMI strategies are better suited for some SBM types. For instance, boundary spanning strategies are particularly important to achieve an SBMs with *stronger orientation towards society and/or the environment*. Likewise, corporate management strategies such as leading by example, employee involvement, and creating a new vision are particularly important for SBMs that are based on *new ways of making business sustainable*. This is because corporate management strategies imply changes in the way firms conduct business that can lead to major changes and tensions in the organization.

To conclude the paper, some implications are drawn. For managers, the review of cases offers a portfolio of strategies to achieve SBMs through BMI. For future research, the authors stress the need for clarity in the use of the BMI and SBM concepts and encourage scholars to treat them as two distinct processes or goals; BMI does not necessarily lead to SBM, and the other way around.

ACKNOWLEDGMENT

We gratefully acknowledge the funding support of the Swedish Energy Agency for the project: innovative business models for large-scale diffusion of solar PV, Grant No. P48527-1.

CONFLICT OF INTEREST

The authors declare that they have no known competing financial interest or personal relationships that could have appeared to influence the work reported in this paper.

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ENDNOTES

- ¹ Definitions of hybrids and variations of SBM and BMI (e.g., business model innovation for sustainability) were also included.
- ² These papers often used the empirical cases as means to illustrate a BMI tool towards SBMs or explore barriers to this process, and as such, no descriptions of SBM types could be identified.
- ³ When one case was studied in several articles, it was only counted as one unique case.

- ⁴ These do not include sharing platforms that only create value for the focal firm and its customers, e.g., by providing users with an increased access to a product (like the various car sharing platforms in Ciulli & Kolk, 2019).
- ⁵ Although value is created and captured on both sides of this platform, the sustainability drivers are less apparent when compared to the peer-to-peer alternatives.
- ⁶ The clients' employees, in the case of THANKS.

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How to cite this article: Mignon, I., & Bankel, A. (2023).

Sustainable business models and innovation strategies to realize them: A review of 87 empirical cases. *Business Strategy and the Environment*, 32(4), 1357–1372. <https://doi.org/10.1002/bse.3192>

APPENDIX A

TABLE A1 Overview of the articles, empirical cases, and findings resulting from the literature review

| Author (year) | Publication outlet | Case | Firm type | Geographical area | Industry | BMI strategy | SBM type |
|----------------------------|---|--|-------------|-------------------|---|--|--|
| Baldassarre et al. (2017) | Journal of cleaner production | THANKS | Start-up | Netherlands | Construction | Use of practical tools and guidelines Experimentation Boundary spanning | Sustainable "raison d'être" |
| Björklund (2018) | Journal of entrepreneurship management and innovation | Adair Bethia Cullodina Dougje Edeen Forba | Established | Sweden | Agriculture | N/A | N/A |
| Bocken et al. (2019) | Journal of cleaner production | THANKS HOMIE | Start-up | Netherlands | Construction Retail | Experimentation Boundary spanning | Sustainable "raison d'être" New ways to make business sustainable |
| Brennan and Tennant (2018) | Business strategy and the environment | Adnamms | Established | UK | Brewing | Boundary spanning | Stronger orientation towards society and/or the environment |
| Ciulli and Kolk (2019) | Journal of cleaner production | Accor-Onefinestay-Squarebreak-Travelkeys Allianz-Car2Go Zurich-Airbnb BMW Car & ride sharing lease BMW-Sixt DriveNow Daimler Car2Go Ford-chariot Jaguar land rover-Lyft RBS-funding circle McDonalds-Uber eats PWC talent exchange Samsung-UpWork IKEA-task rabbit VDL Groep-FLOOW2 | Established | N/A | Hotel Insurance Manufacturing Banking Food Recruitment Retail Construction | Boundary spanning N/A Boundary spanning Boundary spanning Experimentation Boundary spanning Boundary spanning Boundary spanning Boundary spanning Boundary spanning Boundary spanning Boundary spanning | New ways to make business sustainable |

TABLE A 1 (Continued)

| Author (year) | Publication outlet | Case | Firm type | Geographical area | Industry | BMI strategy | SBM type |
|---|--|--|-------------|-------------------|-------------------------|---|---|
| Davies and Doherty (2019) | Journal of business ethics | Cafédirect | Established | UK | Food and beverages | Boundary spanning Experimentation Corporate management | Sustainable “raison d'être” |
| França et al. (2017) | Journal of cleaner production | Aura light | Established | Global | Lighting | Practical tools and guidelines Experimentation | New ways to make business sustainable |
| Franceschelli et al. (2018) | British food journal | Pizza | Start-up | Italy | Food | Experimentation Boundary spanning | Sustainable “raison d'être” |
| Gallo et al. (2018) | Journal of cleaner production | Grenada chocolate company | Established | Grenada | Food | Experimentation Boundary spanning Corporate management | Stronger orientation towards society and/or the environment |
| Geissdoerfer et al. (2017) | Journal of cleaner production | Kallari chocolate | Start-up | Ecuador | Recruitment | Experimentation Boundary spanning | Sustainable “raison d'être” |
| | | Divine chocolate | | | | Experimentation Boundary spanning | |
| | | TCHO | | | | Experimentation Boundary spanning | |
| | | Favalley | | | | Use of practical tools and guidelines Experimentation Boundary spanning | |
| Heyes et al. (2018) | Journal of cleaner production | Micro ICT firm | Established | UK | ICT | Use of practical tools and guidelines | Improvements towards efficiency |
| Hu et al. (2019) Joyce and Paquin (2016) | Sustainability | SKN | Established | China | Architecture | Experimentation | N/A |
| | Journal of cleaner production | Nespresso | Established | Global | Food and beverages | Use of practical tools and guidelines | N/A |
| Khripko et al. (2017) | 14th Global Conference of Sustainable Manufacturing, GCSM 2016 | Flexible blow-film manufacturer Grid operator | Established | Germany | Manufacturing Energy | Experimentation Boundary spanning | Improvements towards efficiency |

(Continues)

TABLE A1 (Continued)

| Author (year) | Publication outlet | Case | Firm type | Geographical area | Industry | BMI strategy | SBM type |
|--|---|---|-----------------------------|---|--|--|--|
| Morioka et al. (2016) | 13th global conference of sustainable manufacturing – Decoupling growth from resource use | Unilever Kao Corp. Woolworth Lotte shopping | Established | Netherlands/ UK Japan Australia South Korea | Manufacturing Retail | N/A | N/A |
| Prendeville and Bocken (2017) | 14th Global Conference of Sustainable Manufacturing, GCSM 2016 | Bundles Fairphone Nudie jeans Orangebox British telecom | Start-up Established | Netherlands Sweden N/A UK | Laundry services Mobile technology Apparel Furniture Telecom | N/A | New ways to make business sustainable Sustainable “raison d'être” New ways to make business sustainable Improvements towards efficiency |
| Schuit et al. (2017) | Product lifetimes and the environment (plate) | THANKS Peerby Mud jeans | Start-up | Netherlands | Construction Retail Apparel | Experimentation Boundary spanning Experimentation Experimentation | Sustainable “raison d'être” |
| Short et al. (2014) | Journal of industrial ecology | British sugar | Established | UK | Food | Corporate management Experimentation Boundary spanning | Improvements towards efficiency |
| Sousa-Zomer and Cauchick-Miguel (2019) | Total Quality Management & Business Excellence | Bike Rio system Water-filtration system | Start-up Established | Brazil | Mobility Water supply | Boundary spanning Boundary spanning | New ways to make business sustainable |
| Stubbs (2019) | Corporate social responsibility and environmental management | FSB | Established | Australia | Banking | Corporate management Boundary spanning | Stronger orientation towards society and/or the environment |
| Todeschini et al. (2017) | Business horizons | Preza Revoada Colibri Contextura Armadio Verde Orange Fiber Lanieri ELSE Corp. | Start-up | Brazil Italy | Fashion | Experimentation Experimentation Boundary spanning Boundary spanning N/A Experimentation N/A Experimentation | Sustainable “raison d'être” New ways to make business sustainable |

TABLE A1 (Continued)

| Author (year) | Publication outlet | Case | Firm type | Geographical area | Industry | BMI strategy | SBM type |
|-------------------------|---|--------------------------|-------------|-------------------|-----------------------|--|---|
| Tolkamp et al. (2018) | Journal of cleaner production | Philips lighting | Established | Netherlands | Lighting | Boundary spanning Experimentation | New ways to make business sustainable |
| | | Eneco | | | Energy | N/A | |
| | | Buurkracht | N/A | | Construction | Experimentation Boundary spanning | Stronger orientation towards society and/or the environment |
| | | Nederland Isoleert | | | | N/A | Improvements towards efficiency |
| | | Led design Holland | | | Lighting | N/A | |
| | | Philips lighting | | | | Experimentation Boundary spanning | |
| | | Greeniant | | | Appliance maintenance | Experimentation | New ways to make business sustainable |
| | | Bas Nederland | | | Energy | Experimentation | |
| | | Woonconnect | | | | Boundary spanning | Improvements towards efficiency |
| | | Reinmarkt | | | Retrofitting | N/A | |
| Ulvenblad et al. (2019) | Journal of integrative environmental sciences | Company A | Established | Sweden | Agriculture | Corporate management Experimentation | N/A |
| | | Company B | | | | Boundary spanning Corporate management | Stronger orientation towards society and/or the environment |
| | | Company C | | | | Experimentation Boundary spanning | |
| | | Company D | | | | Experimentation | N/A |
| | | Kipster | Established | Netherlands | N/A | Boundary spanning | Sustainable "raison d'être" |
| | | DSM- Niaga | | | | Boundary spanning Experimentation | New ways to make business sustainable |
| | | Philips - new Karolinska | | | Manufacturing | Boundary spanning | Stronger orientation towards society and/or the environment |
| | | BeeBanking | | | Art institute | Boundary spanning Experimentation | |
| | | Food-for-feed-for-food | | | Food | Boundary spanning Corporate management | Sustainable "raison d'être" |
| | | Thuisbaas | | | N/A | Experimentation | |

(Continues)

TABLE A 1 (Continued)

| Author (year) | Publication outlet | Case | Firm type | Geographical area | Industry | BMI strategy | SBM type |
|--------------------|-------------------------------|-------------------------|-------------|-------------------|---------------------------------|-----------------------------------|---------------------------------------|
| Yang et al. (2017) | Journal of cleaner production | Futureproof | | | Sales of roof and façade panels | Boundary spanning Experimentation | |
| | | Ecor circular Friesland | | | N/A | Boundary spanning Experimentation | Improvements towards efficiency |
| | | One | | | Construction | Experimentation | N/A |
| | | Case A | Established | China | Manufacturing | N/A | New ways to make business sustainable |
| | | Case B | | | | | |
| | | Case C | | | Retail | | |
| | | Case D | | | Manufacturing | | |
| | | Case E | Start-up | UK | Mobility | | |
| | | Case G | Established | US | Manufacturing | | |