Business models for environmental sustainability: Contemporary shortcomings and some perspectives

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Abstract
Recently, business models for environmental sustainability have gained increasing attention in the management field and among practitioners and stakeholders. This study aims to analyse the state of the art on the topic by reviewing the growing but mainly phenomenon-driven research. In particular, by identifying main research trends and relevant gaps in the literature and by providing future research avenues, this paper advances the debate on the need for alternative concepts of doing business that go beyond the creation of economic value for a company in a way that generates value for the society.

Our article undertakes two stages of screening the available literature and selects 151 peer-reviewed articles published between 2007 and early 2019 for the review. The paper provides the first comprehensive systematic review of business models in the field of environmental sustainability with a detailed descriptive and critical analysis and with a discussion of future research opportunities.

KEYWORDS
business models, environmental sustainability, social value, sustainable development, sustainable transition

1 | INTRODUCTION

In line with major international reports such as the UN (United Nations) Global Environmental Outlook (GEO; UN Environment, 2019) and the Intergovernmental Panel on Climate Change's (IPCC) global warming report on 1.5°C (IPPC, 2018), scholars pay increasing attention to market transformations and business models (hereafter BMs). The standard definition of BMs can be delineated as the configuration of customer sensing, customer engagement, value delivery and monetization components that captures causal links between value creation and value capture at the business level (Baden-Fuller & Mangematin, 2013; Zott, Amit, & Massa, 2011). In general, research on BM is concerned on how firms realize the creation and appropriation of economic value (Teece, 2010).

The BM topic has been applied in multiple contexts and management areas (Zott et al., 2011; Cosenz, Rodrigues, & Rosati, 2019), such as e-business (Gordijn & Akkermans, 2001), strategy (Teece, 2010; Zott & Amit, 2008), technology and innovation management (Chesbrough & Rosenbloom, 2002), but also in social issues-related areas (Seelos & Mair, 2005; Yunus, Moingeon, & Lehmann-Ortega,-2010). Recently, a part of the literature has started to pay attention to BMs in the field of environmental sustainability (hereafter ES) (Boons and Lüdeke-Freund 2013; Schaltegger, Ludeke-Freund, & Hansen, 2012), as being relevant for both research and practice (Ludeke-Freund & Dembek, 2017).

Despite the increasing number of papers, there is a gap towards (i) a comprehensive systematic review at the intersection of BMs and ES, based on a rigorous methodology (Tranfield, Denyer, & Smart, 2003), and (ii) strategic conclusions for further BM research in
light of environmental urgencies (e.g., climate change, the need of clean energy; Sommer, 2012) and need for broader transformations. Closing those gaps is the main aim of this paper.

Up to now, the vast majority of existing reviews on BMs and sustainability has concentrated on specific main domains related to ES, such as (i) categorization of BMI archetypes (Bocken, Short, Rana, & Evans, 2014); (ii) BMs for renewable or sustainable energy (Engelken, Römer, Drescher, Welpe, & Picot, 2016; Niesten & Alkemade, 2016; Richter, 2012; Shomali & Pinkse, 2016); (iii) BMs for circular economy (CE; Lewandowski, 2016; Nussholz, 2017); (iv) sustainable BM innovation (BMI; Geissdoerfer, Vladimirova, & Evans, 2018; Tell, Hoveskog, Ulvenblad, Barth, & Ståhl, 2017); and (v) product–service systems BMs (Reim, Parida, & Örtqvist, 2015). Although on the one hand, the specificity of these studies may contribute to understand particular aspects, it systematically fails to capture the full scope of interactions between BMs and the wide area of ES. In this paper, we consider ES as a broad and inclusive concept, including different environmental management practices (Levy, 1997) that aim to ameliorate the impact of the business on the natural environment, such as organizational and managerial capabilities required to address sustainability aspects, environmental and CE practices, and strategies or management aspects based on sustainability and environmental innovation (related to products/services or processes) and sustainable performance. Accordingly, until now, a systematic review based on all aspects related to ES at business and management level does not exist, and the existing literature does not provide a comprehensive descriptive and critical analysis of the studies on BMs and ES.

In line with our aim above, the specific novel contributions of our paper are as follows:

1. We provide, at the best of our knowledge, the first comprehensive review of the studies on BMs in the framework of a wide ES concept, to debate in a critical way the current research on the topic.
2. The review includes the first full descriptive and critical analysis of different aspects characterizing the studies on the topic, not focusing only on few ES aspects, but taking also into account the multiple dimensions of ES in a unique study. We shed light on relevant trends and journals; on the economic or industrial sectors covered by the studies; and on the methods used.
3. This study includes a framework of all theoretical perspectives used in the existing studies on BMs and ES, by helping to set the topic under specific theoretical lens and mapping the subtopics.
4. By contributing through a systematic review of the literature, this study also suggests a critically informed agenda to inspire future research opportunities on the topic. By doing this, the study suggests some research avenues to offer a strategic platform whereby future researchers could build on our ideas to further develop research on BMs for sustainability.
5. Our paper aims also to support companies and practitioners to choose and adopt a proper BM in the case of green strategies, as it is essential to create and appropriate value from ES activities rather than just complying with the law. In this sense, this paper can support companies and practitioners to match value creation—consisting of societal benefits arising from green activities—with value appropriation in terms of profit capture at the firm level.

The paper is organized as follows. After a section describing the method adopted to systematically review the literature, we report the results of the selection and analysis of 151 articles on BMs and ES. Analysed papers have been published in the period of 2007 to mid-January 2019, as BM has become pivotal in the business research in the last years (Spith, Schneckenberg, & Ricart, 2014; Zott et al., 2011). A descriptive section is included as part of the results of this review. Moreover, an in-depth analysis covering the research streams covered by the reviewed papers is provided. The paper then offers key insights on potential future research avenues on the topic. The final part of the paper provides some conclusions based on the results of the review.

2 | METHOD

For the review section, we adopted a systematic approach, as it represents a rigorous method aiming to produce reliable knowledge in the management field (Tranfield et al., 2003). Specifically, we adopted the three phases identified by Tranfield et al. (2003): planning, conducting and reporting and dissemination.

2.1 | Planning

In the planning phase, the aims of the review and the specific research questions of a systematic review on BMs in the context of ES have been defined. With the aim to provide a rich descriptive analysis of the studies on the topic, the paper aims to explore different aspects. One of these is the evolution trend of studies on BMs and ES in the last more recent decade. Another aspect is to investigate the relevance of this topic in the academic journals, taking into account the number of articles published. The industrial sectors covered by those studies, including the methods used, are explored. In addition, we aim to understand the theoretical perspectives that those papers apply.

As the topic of BMs is even more important in the framework of ES (Bocken et al., 2014), this review also aims to reply to the following research questions: what are the areas investigated about BMs and ES that have been addressed by the existing literature and where could future research in this area go? To reply to the first question, we focus on the main aspects covered by the current literature and studies about the topic to identify research streams, whereas to address the second question, we propose several research paths drawing on our findings in order to improve the comprehension of the phenomenon as well as to provide critical reflections on how to widen this promising area of research.

The ES referred to a business-level perspective is quite a huge area, covering all environment-friendly strategies, technologies, processes, products, services, innovations and, in general, all activities that a company adopts, offers or develops to be respective of the
natural environment. The wide research framework on ES activities at business level (Hegevold et al., 2014) recalls that one of the research questions we defined in the planning phase is what are the specific management aspects of ES faced by the papers analysed for this review.

### 2.2 Conducting

In the conducting phase, we first collected sources from the ISI Web of Knowledge Social Sciences Citation Index (SSCI) database, as it is considered as one of the most complete databases including peer-reviewed journals in the area of social sciences (Crossan & Apaydin, 2010). The field of BMs and ES is largely rooted in the social sciences, but also includes interdisciplinary journals that are not listed in the SSCI. We decided to not use a larger journal list initially as such a list would have been impractical, because it would have generated an excessive number of abstracts for manual inspection; the great majority of which would have had to be rejected.

We restricted the sources of data to peer-reviewed journals (Podsakoff, Mackenzie, Bachrach, & Podsakoff, 2005). We defined the selection criteria for the research and, in particular, the keywords. The search in the database started by using the keyword 'Business Model' or 'Business Models'. Regarding the area of ES, any keyword has been included. This is because ES is a huge topic and the general selection strategy we used by including keywords for the topic of BM maximizes the inclusion of all studies. Keywords have been limited for the research to the title, abstract or keywords of studies. Moreover, we defined as document type all studies related to 'Article'. Other criteria included studies in 'English'; the subject areas were 'Business' and 'Management'. We limited the research to the articles published in the time frame from year 2007 (some seminal papers on the topic have been published in that year, e.g., Chesbrough, 2007a, 2007b; Zott & Amit, 2007; Chesbrough & Schwartz, 2007) to mid-January 2019 because in the last years, the research on BM has become pivotal (Spieth et al., 2014; Zott et al., 2011). The research has been performed between early February 2018 and mid-January 2019. The initial result of this research on the database included 1,502 papers.

The first selection and assessment of the collected studies have been carried out by reading the abstract of all papers to identify whether the ES topic was included in each study. This first screening allowed to select 140 papers for further analysis. Then, we agreed to restrict the study to some criteria to proceed with the research. The first inclusion criterion was that a paper must deal with the BM topic and with the ES topic in a non-marginal way (Zott et al., 2011). The second criterion refers to the fact that each article should consider the BM in the case of private organizations (and not referred, e.g., to public organizations, consumers or cities) as the aim of this study is to refer the BM topic to business firms (Zott et al., 2011). After having defined the two criteria, a second screening has been performed, by reading the full content of the 140 papers. The result consisted of a sample of 61 selected papers.

In order to make the review fully comprehensive, as environmental aspects of management are sometimes discussed in interdisciplinary journals that are not listed in the ‘Business’ or ‘Management’ subject areas of SSCI, we identified further articles in those interdisciplinary journals. To this purpose, we surveyed the authors of the selected papers, by sending our invitation to reply to 105 email addresses. In a second stage of conducting our research, the survey has been also launched to the Organization and Environment (ONE) division members of the Academy of Management (AOM) community, including around 700 members. The AOM community is the most important organization in the world of academic scholars in the management field. The survey asked which journals they engage with more frequently. Taking into account the results of the survey, based on a final sample of 37 replies, four additional journals have been added: Journal of Cleaner Production; Sustainability; Journal of Industrial Ecology; and Resources Conservation and Recycling. We proceeded with the same process followed in the first selection and by applying the same criteria and screenings for the four additional journals. The final result of this selection included 90 additional papers, which, together with the first 61 selected papers, composed the final sample for the review, based on 151 papers. Figure 1 illustrates both stages of conducting our research, the criteria and the resulting final sample.

### 2.3 Reporting and dissemination

In the reporting and dissemination phase of the systematic review, we described the collected and screened studies and we replied to the defined research questions. To do that, we applied one of the key principles of a good systematic review defined by Tranfield et al. (2003). In particular, we categorized the information of the papers to address two objectives. The first one was to synthesize the collected information through a descriptive analysis of the topic investigated. Second, the categorization of information has also been performed with the aim to reply to the research questions leading the systematic review. To categorize all papers of the final sample and to reply to the research questions, they have been coded according to defined categories in an excel sheet. These categories included topics investigated and research questions, research methods applied, ES dimensions, economic sectors represented and main findings. Starting from them, we identified four main research streams where we found some gaps. In doing that, we critically assess the research on BMs for ES, by investigating where, how and by whom this topic has been studied (Athwal, Wells, Carrigan, & Henninger, 2019).

The results of the third phase of the systematic review are included in the following section.

### 3 RESULTS

The first section on the results is based on a descriptive analysis of the sample of the selected papers.
3.1 | Descriptive analysis

The 151 selected papers on BMs and ES appeared in 32 journals. The most relevant journals in terms of number of papers are *Journal of Cleaner Production* (including about 46% of the papers), *Sustainability* (11%), *Business Strategy and the Environment* (about 9%), and *Organization & Environment* (6%). As the topic of this review is about BMs and ES, it is not surprising that journals more focused on environmental issues are more relevant in terms of number of papers. Table 1 includes details on the other journals.

The research attention to the field of BMs and ES has generally grown in the last 11 years (Figure 2). There has been a slight and negligible decrease in the number of publications in the years 2010 and 2012. It is interesting to highlight the rapid increase in the number of papers on the topic in the years 2016, 2017 and 2018. These data suggest that the academic interest in this research area is recently becoming even more important.

Regarding the research methods applied, most of the studies are qualitative (about 68% of the articles), approximately 9% are quantitative, about 18% are conceptual and about 5% used mixed methods.
Determining the environmental aspects investigated in relation to the BM topic. Most studies considered ES aspects at business level (30% of the papers), such as the analysis of organization and managerial capabilities, practices and strategies, management aspects based on sustainability, or the transition path of the company towards sustainability. The topic of environmental innovation—as green product, service or technology—is also another important aspect studied in relation to sustainable BMs (18.5% of the sample). The focus on sustainable BMs is the central aspect of 18% of the papers. In these cases, papers deal with the analysis of environmental impacts of BMs or with sustainable value creation. The CE area (including BMs for CE) is an aspect of interest for 17% of the papers. Some papers paid attention to investigate a specific green sector, such as renewable energy or sustainable mobility, whereas a minor part of the sample studied BMs, taking into account the sustainable performance of the company (as social, economic and environmental performance). Almost surprisingly, considering how central climate change is as a sustainability challenge, only one paper of the sample is strictly linked to climate change.

We also analysed the economic sectors represented in the sample (Figure 3). Many studies (n = 32) do not specify the sector taken into account. This is due to the fact that the sector analysed is not mentioned or the paper has not analysed any sector in particular (e.g., this is the case for conceptual papers). A high number of papers (n = 33) deal with multiple sectors, meaning two or more. The energy field is highly represented (18 papers), and this reflects the importance of the sector in the framework of ES. Chemical and plastic, tourism and other professional sectors (e.g., design) are the less represented sectors.

### 3.2 Research streams: Key insights from the existing studies

The studies selected for the review faced multiple and heterogeneous topics and investigated different research questions. The details of our analysis of the investigated fields are reported below. The analysed literature showed that the research area of BMs and ES is very rich and huge in terms of subtopics addressed, spanning from the
description of specific dimensions, characteristics and typologies of BM, to the theoretical perspectives on this area of research, to the design and organizational capabilities required for BMs for ES and to the area of BM and performance.

3.2.1 First stream of research: Description, characteristics and typologies of sustainable BMs

There are several papers dealing with the description of BMs for sustainability (Abdelkafi & Täuscher, 2016; Biloslavo, Bagnoli, & Edgar, 2018; Birkin, Polesie, & Lewis, 2009; Girotra & Netessine, 2013; Høgevold & Svensson, 2012; Lozano, 2018); these studies take into account a number of aspects, showing the multidimensional nature of this research domain. The aspects identified in those papers highlight also which main environmental sustainability dimensions deserve more attention.

Aspects of sustainable BMs

Some authors focused on specific aspects or dimensions of sustainable BMs (Boons & Ludeke-Freund, 2013; Boons, Montalvo, Quist, & Wagner, 2013; Khmara & Kronenberg, 2018; Päätäri, 2010; Päätäri & Sinkkonen, 2014; Peltola, Aarikka-Stenroos, Viana, & Makinen, 2016; Siqueira & Pitassi, 2016; Stubbs, 2017; Tsvetkova & Gustafsson, 2012; Wainstein & Bumpus, 2016), such as components (Calabrese, Forte, & Levialdi Ghiron, 2018; Quintás, Martínez-Senra, & Sartal, 2018), their evolution (Bohnsack, Pinkse, & Kolk, 2014), main principles (Upward & Jones, 2016) and their scalability (Jabloński, 2016). Within this stream of research, we also identified studies on drivers and barriers to BM adoption (Abuzeinab, Arif, & Qadri, 2017; Høgevold et al., 2014; Matos & Silvestre, 2013; Rauter, Jonker, & Baumgartner, 2017). Value creation and value proposition are dimensions of BM that are central in some papers (e.g., Bohnsack & Pinkse, 2017; Hemmann & Wügger, 2017; Ludeke-Freund & Dembek, 2017; Yang, Vladimirova, & Evans, 2017). These studies are very oriented to the description of multiple aspects that characterize BMs for ES.

Typologies of sustainable BMs

In this research stream, we included papers that detailed specific typologies of BMs (e.g., Gaiardelli, Resta, Martinez, Pinto, & Albores, 2014). Some papers focus on BM canvas (Beh, Ghobadian, He, Gallea, & O’Regan, 2016; Joyce & Paquin, 2016); hybrid BMs (Hahn & Ince, 2016), defined as those that deliver value in addition to pursuing financial aims; associative sustainability BMs (Gallo, Antolin-Lopez, & Montiel, 2018); or crowdfunding BM (Vasileiadou, Huijben, & Raven, 2016). Some authors discussed innovative BM as one of the components of clean technology efforts at a company level (Johnson & Suskewicz, 2009), whereas others analysed different sustainable BMs of large international firms (Ritala, Huotari, Bocken, Albareda, & Puimalainen, 2018). Among the typologies of BMs for ES, some papers addressed BMs in the case of specific sectors (e.g., Ford & Despeisse, 2016; Pal & Gander, 2018; Johannsdottir 2014; Yip & Bocken, 2018), like energy and renewable energy (Bryant, Straker, & Wrigley, 2018; Flodén & Williamsson, 2016; Hellström, Tsvetkova, Gustafsson, & Wikström, 2015; Rohrbeck, Konnertz, & Knab, 2013; Strupeit & Palm, 2016), including BM as a tool to explore photovoltaic systems or the case of BMs in the biofuel transport. Other authors explored sustainability and BMs in the context of the beer and wine sector (Diaz-Correa & Lopez-Navarro, 2018; Wells, 2016). Some studies deal with BMs in mining (Bini, Bellucci, & Giunta, 2018) and bioplastic fashion industry (Illes & Martin, 2013). Finally, the paper of Bocken (2015) is on venture capitalists and sustainable BMs, whereas that of Esslinger (2011) deals with sustainable BMs implemented by designers. Our review identifies the energy sector as the main one to which research on BM is focused. This limited investigation shows that there is a need to explore the area of BMs for ES also in other sectors.

With respect to papers dealing with aspects of sustainable BMs, studies mainly oriented to typologies of BM for ES paid more attention to concrete examples, applications and sectors. However, we found that these articles are mainly descriptive rather than based on a critical analysis of characteristics, features and dimensions of BMs. The wide but fragmented framework related to these multiple descriptive contributions allows discussing potential aspects of BMs.
new research avenues based on more analytical analysis of BMs. The contribution we propose is discussed in the last section of this paper.

**Servicizing BMs**

Going more in depth to specify specific BMs, there is a part of the literature that deals with servicing BMs (Corvellec & Stal, 2017; Liu, Chen, Tu, & Wang, 2014; Överholm, 2017), which are BMs related to the selling of the product use instead of the products itself (Agrawal & Bellos, 2017). This kind of BMs is typically beneficial under the environmental point of view and is recently receiving growing interest, in line with questions for CE (Geng, Sarkis, & Bleischwitz, 2019).

Most authors focused on sustainable BMs and product-service systems. Some of them explored this kind of BMs to understand if they may contribute to better sustainability or economic and environmental opportunities linked to servicing BMs. The paper of Edvardsson and Enquist (2011) is about sustainable BM for values-based service, with a focus on service excellence and service innovation. Naor, Druheli and Bernardes (2018) showed a case study of a firm adopting a servitization BM for electric vehicles. Enquist, Sebathe and Johnson (2015) considered open BMs in the case of sustainable services, similar to Anttonen’s (2010) study on BMs for chemical and management resource services.

**Sharing BMs**

Similar to servicing BMs, sharing BMs are based on the principle that individuals have access or share products and services instead of buying them. The area of sharing BMs is explored in some papers. Bellos, Ferguson and Toktay (2017) focused on car sharing BM. Also, Cohen and Kietzmann (2014) focused on new sustainable BMs for shared mobility. Kathan, Matzler and Veider (2016) investigated how BMs are affected by sharing economy. There is also a review paper (Boons & Bocken, 2018) dealing with the impact of sharing BMs for personal mobility. The analysis of the papers shows that the area of BM and the sharing economy is mainly focused on mobility. The literature on BM promoting a sharing economy appears to be almost fragmented; it highlights the need to further investigate the relations with other kinds of BMs as also with the ecosystem, as the sharing economy is perceived as a complex process of social change, as clearly identified by Boons and Bocken (2018).

**BMs for CE**

The development of BMs is a crucial aspect of the research on CE (Chen, Hung, & Ma, 2020; Merli, Preziosi, & Acampora, 2018). Indeed, the implementation of CE requires companies to overcome the linear BM of taking materials and components, producing goods and services and selling them to customers, and to radically rethink product and process design (EC 2015) with strategic effects on their BMs. Papers dealing with BMs for CE cover a high number of aspects. They go from BM change for CE (Perey, Benn, Agarwal, & Edwards, 2018; Urbinati, Chiaroni, & Chiesa, 2017; Weissbrod & Bocken, 2017) to challenges, drivers and barriers faced by companies in the case of adoption of BM based on CE principles (Despeisse et al., 2017; Hopkinson, Zils, Hawkins, & Roper, 2018; Linder & Willander, 2017; Oghazi & Mostaghel, 2018; Rizos et al., 2016; Sousa-Zomer, Magalhaes, Zancul, & Cauchich-Migueu, 2018; Stal & Corvellec, 2018). In this area of research, which is very recent taking into account the timeframe of our review, as most of papers dealing with BMs for CE have been published between the year 2015 and the year 2018, extant literature suggests that changes required to implement CE BMs are obtained through the integration of a number of organizational functions. The literature highlights how BMs for CE include a lot of benefits, but at the same time, it also recognizes barriers and difficulties companies found in the transition process towards CE. Other studies dealing with value creation and proposition linked to CE BMs (e.g., Manninen et al., 2018; Ranta, Aarikka-Stenroos, & Makinen, 2018; Schenkel, Krikke, Capiels, & van der Laan, 2015). A part of the literature discussed different BM archetypes (e.g., Kortmann & Piller, 2016).

The CE BMs and eco-design is a topic of the extant literature, and specifically, it considers the role of product design in CE BMs (e.g., Mendoza, Sharmina, Gallego-Schmid, Heyes, & Azapagic, 2017; Moreno, De los Rios, & Charney, 2016; Sumter, Bakker, & Balkenende, 2018). Finally, a part of the analysed studies deals with the adoption of CE strategies and their integration with BMs in the case of specific sectors (Bressanelli, Adrodegari, Perona, & Saccani, 2018; Heyes, Sharmina, Mendoza, Gallego-Schmid, & Azapagic, 2018; Whalen, Milios, & Nussholz, 2018). In spite of the numerous aspects explored by the current literature on BMs for CE, we found a gap related to the depiction of the social aspects linked to BMs for CE. We propose more research on BMs for CE by also taking into account social consideration in the last section of the paper.

### 3.2.2 Second stream of research: Theoretical perspectives on BMs for ES

The analysis of the theoretical perspectives adopted by studies on BMs and ES at the organizational level allowed us to explore the theories applied. Most of the papers (n = 134, corresponding to 89% of the sample) tended not to be conveyed on a strong theoretical base. This means that those studies did not explicitly refer to a theoretical position and rather usually include BM literature instead of a real and strong theoretical base. Only 17 papers (11% of the sample) included a theory in the study. Most commonly used theories were the stakeholder theory and the resource-based view theory (four papers each), followed by institutional theories (three papers). The high use of the stakeholder theory may be explained by the fact that it is one of the most popular theories in the management field; it has also been largely adopted in the area of sustainable business (Daddi, Todaro, De Giacomo, & Frey, 2018). The stakeholder theory is based on a strong role of stakeholders in the strategies setting at a firm level; for this reason, this theoretical perspective may be particularly useful in studies on BMs and sustainability, where the adoption of sustainable strategies is usually a core topic. The resource-based view theory deals with understanding the firm’s competitive advantages (and the related value-creating strategies) based on multiple resources of a firm. The
popular use of this theoretical approach by studies on BMs and sustainability may be explained by the need to know, among others, the relationship between value creation (which is a key element of BMs) and the adoption of sustainable resources at a firm level.

The dynamic capability theory, grounded theory and resource dependence theory have been included in two papers each. Other theories, such as adaptive co-management, adaptive, agency, evolutionary, market-based view, multilevel perspective, network, and option theories, have been used in one paper each.

The analysis we performed on the theoretical lens used in the papers suggests the debate on BMs and ES at the organizational level is mainly atheoretical or, alternatively, the implicit theoretical positions that are guiding how researchers think are not being critically examined and explicitly reported. This result may be justified by the evidence that the topic is rather driven by a phenomenon perspective.

The low level of theoretical perspectives adopted in the research on BMs for sustainability allows us to discuss the need to develop more research based on the development of theoretical perspectives in the BMs area. Our ideas are included in the last section of the paper.

3.2.3 | Third stream of research: Design of BMs for ES and organizational capabilities required

The design of BMs for sustainability—meaning the development of sustainable BM—is another interesting field of research for the scope of this paper (e.g., Asif, Lieder, & Rashid, 2016; Bocken, Boons, & Baldassarre, 2019; Hahn, Spieth, & Ince, 2018; Kurucz, Colbert, Luedcke-Freund, Upward, & Willard, 2017; Stubbs & Cocklin, 2008; Tolkamp, Huijben, Mourik, Verbong, & Bouwknegt, 2018; Yi, Lee, & Kim, 2017). Some authors focused on life cycle analysis (LCA) to evaluate negative environmental burdens of business activities and suggested the design of sustainable BMs (Scheepens, Vogtländer, & Brezet, 2016). Similarly, others deal with sustainable BMs design supporting value creation in the area of life cycle business (Jabloński & Jabłoński, 2016). Some studies analysed BM design taking into account green product innovation and company performance (e.g., Ma et al., 2018). The paper of Lloret (2016) is based on previous literature to develop a BM for sustainability. Similarly, other authors proposed a sustainable BM or presented a conceptual BM for sustainability.

There are some studies centred on how companies can integrate sustainability aspects in their BMs (Breher, Podoylnitsyna, & Langerak, 2018; Bryson & Lombardi, 2009; Stubbs, 2007). Others explored how sustainability is reflected in a firm’s activities through their offerings, pricing and distribution actions (Morrish, Miles, & Polonsky, 2011), or how sustainability adds value to the BM of a fashion company (Lueg, Pedersen, & Clemmensen, 2015). Some recent studies investigated relationships between different BMs of firms and their engagement in corporate social responsibility, including also an environmental dimension (Witek-Hajduk & Zaborek, 2016). Finally, one paper explored the effects of reporting on the combination of environmental, social and governance issues into BM and the effects on the performance (Maniora, 2017). Assessing environmental impacts requires a method such as LCA; it involves the monitoring and reporting efforts of companies. As a result of those activities, firms discover a need to innovate in order to meet environmental goals. Thus, our paper also includes studies on BMI here. There is an increasing and recent attention by research on the topic of BMI. This is unsurprising given the nature of the challenges business faces as a response to ES, for instance, decisions to achieve net-zero carbon emissions by 2050. BMI has been defined in multiple ways by the literature, but in general, it can be considered as a ‘process that deliberately changes the core elements of a firm and its business logic’ (Bucherer, Eisert, & Gassmann, 2012, p. 184). A part of the papers of the sample explored the topic of BMI for sustainability (e.g., Davies & Chambers, 2018; Gorissen, Vrancken, & Manshoven, 2016; Oskam, Bossink, & de Man, 2018; Reficco, Gutierrez, Jaen, & Auleta, 2018) from different sides. Analysed papers focused on BMI as strictly connected to the organizational and company dimensions (Todeschini, Cortimiglia, Callegaro-de-Menezes, & Ghezzi, 2017; Wadin, Ahlgren, & Bengtsson, 2017), or on the effects of BMI on organizational (Carayannis, Sindakis, & Walter, 2015) or corporate sustainability (Pedersen, Gwozdz, & Hvass, 2018). Some authors explored BMI for sustainability (Baumgartner & Rauter, 2017; Franca, Broman, Robert, Basile, & Trygg, 2017; Short, Bocken, Barlow, & Chertow, 2014), also paying attention to ways firms do BM change (Brennan & Tennant, 2018; Franceschini & Pansera, 2015; Gauthier & Gilomen, 2016; Rajala, Westerlund, & Llampikoski, 2016) or on BMI and value proposition (Baldassarre, Calabretta, Bocken, & Jaskiewicz, 2017; Geissdoerfer, Bocken, & Hultink, 2016); others investigated BMI for sustainability transition (e.g., Battistella, Cagnina, Cicero, & Preghenella, 2018; Long, Looijen, & Blok, 2018; Schaltegger, Ludeke-Freund, & Hansen, 2016; van Bommel, 2018). Also, the area of drivers for BMI is explored in some papers (Rantala, Ucko, Saunila, & Havukainen, 2018; Zollo, Cennamo, & Neumann, 2013), and a number of papers deal with BMI in the case of specific sectors, such as energy (Bolton & Hannon, 2016; Rossignoli & Lionzo, 2018), biogas (Karlsson, Hoveskog, Hallå, & Mattsson, 2018), construction (Zhao, Chang, Hwang, & Deng, 2018), building (Leising, Quist, & Bocken, 2018; Zhao, Pan, et al., 2018; Zhao, Pan, & Chen, 2018) or other innovative firms (Karlsson, Hallå, Mattsson, & Hoveskog, 2017).

A part of the literature also investigated the organizational capabilities needed to develop sustainable BMs (Cantino, Devalle, Cortese, Ricciardi, & Longo, 2017; Khan, Daddi, & Iraldo, 2020; Melissen, Cavagnaro, Damen, & Düweke, 2016; Nidumolu, Prahalad, & Rangaswami, 2009), including how firms define organizational capabilities, routines and processes to achieve BMI for sustainability (Inigo, Albareda, & Ritala, 2017).

The research on BM for sustainability is very recent, and the low attention of current literature on design aspects linked to this kind of BMI suggests that this field of research should be further developed. The review also highlights that the literature on BMI is very huge and heterogenous, suggesting that the debate on BMI becomes more ambitious, following a range of companies adopting far-reaching goals.
such as net-zero carbon. Finally, there is a low number of papers about organizational capabilities needed for this kind of BMs. We suggest that further research is needed to investigate all these gaps in the area of ES.

### 3.2.4 Fourth stream of research: BMs and performance

The aspects related to the company performance are pivotal in the BM area, as BM may help to clarify how firms link to value creation and value appropriation. Some papers of the sample paid attention in particular on how to link financial performance with sustainability performance (Table 2). Another interesting research area aims to develop a theoretical base to clarify BMI and the consequent better economic, environmental, and social performance that can be derived at the organizational level. We found that the literature on BMs and performance often creates a debate on how to match financial performance with environmental, social, and governance performance at the firm level by taking into account BMs. These aspects are thus crucial for companies putting environmental dimensions at the centre of their organizational and management strategies. In other words, the analysed papers clearly show how the interlinks between financial or economic performance from one side and sustainability performance on the other side are crucial when considering BMs. However, we found that the current debate on this area is fragmented and contradictory, which shows how little we know on the effects of BM on performance. Moreover, our review highlights that current research on this area does not pay attention to how companies appropriating value from green BMs can create public value for the society in doing this

| TABLE 2 | Business model and performance |
|---|---|---|---|
| **Topic** | **Subtopic** | **Main findings** | **Authors** |
| BM and performance | •How the relationship between financial and sustainability performance impacts on BM of ecopreneurs | BM of ecopreneurs change some of the disvalue of products without a green side into value. | Jolink & Niesten, 2015 |
| | •Match financial performance, environmental, social and governance performance. | By focusing on the environmental, social and governance (ESG) issues, firms can achieve both financial and ESG performance. | Eccles & Serafeim, 2013 |
| | Social and environmental performance of companies paying attention to new sustainable BMs | The lack of skills, finance and knowledge prevents the inclusion of sustainable development in firms and causes an underperformance. | Birkin, Cashman, Koh, & Liu, 2009 |
| | •Present a framework to help firms towards sustainable BMs by indicating how to align firms to sustainability performance objectives. | Some convergent aspects were identified as important efforts helping the inclusion of sustainability into sustainable BM’s value creation and delivery. | Morioka, Bolis, Evans, & Carvalho, 2017 |
| | •Whether firms change their BMs profit from sustainability | 37% of survey respondents report their organization’s profit from sustainability. But 63% of them also say their organization has changed its business model to reply to sustainability. | Kiron, Kruschwitz, Reeves, & Goh, 2013 |
| BMI and performance | •Role of innovation and BMs to integrate sustainable management and economic and environmental performance | Dissimilarities among the integration and economic and environmental performance depend on the kind of BM or innovation adopted. | Hall & Wagner, 2012 |
| | •Clarify BMI and the better economic, environmental and social performance | The study contributes to the sustainable BM area, focusing on economic, environmental and social flows of value creation, delivery and capture. | Evans et al., 2017 |
| Specific BMs typology and performance | •Discuss on the sustainability performance of BMs for circular economy | Results confirm previous research on sustainable BMs derived from creating value from waste. | Geissdoerfer, Morioka, De Carvalho, & Evans, 2018 |
| | •Product–service system BMs to explore factors that affect environmental performance. | Six factors were identified to analyse business practices. | Retamal, 2017 |

*Abbreviations: BM, business model; BMI, business model innovation.*
transition. We discuss this potential research avenue at the end of the paper.

4 | WHERE COULD THE RESEARCH ON BMS FOR ES GO? A CRITICAL ANALYSIS AND FUTURE RESEARCH AGENDA

This study depicts the topic of BMS and ES as a relevant and rapidly evolving area of research. To move BMS towards a more sustainable future requires a higher level of understanding of the multiple aspects that are crucial to support business in their path towards sustainability. This recalls further and critical studies of the main research gaps, as introduced above. The outlined research streams—description, features, typologies of sustainable BMS; theoretical perspectives; design of BMS for ES and organizational capabilities required; and BM and performance—require broader and critical investigation to understand better how companies can concretely and widely pursue ES through their BMS and how they can create sustainable value also for the society. Moreover, the research avenues we propose offer to future researchers a strategic platform whereby they could build on our ideas to further develop research in the area of BMS for sustainability.

4.1 | Research avenue no. 1: Description, features and typologies of sustainable BMS

This review highlights that many studies dealing with descriptive aspects of BMS for ES do exist. Despite this, the research lacks a theory-grounded critical analysis and there is a limited systemic discussion of key aspects of BMS linking them with broader environmental goals such as net-zero carbon or biosphere integrity. We suggest further research that develops in a more critical and comprehensive way the characteristics of BMS for ES. Future studies may explore, starting from the current research, what are the strengths and the weaknesses of those BMS with the aim to propose alternative valid solutions. Characteristics of BMS for ES may also be explored to understand how they may contribute to a large-scale societal transformation towards a wide concept of sustainability. Indeed, research on sustainability transition has highlighted the need to focus on ecology and socio-ecological relations and on the role of social BMS to understand this transition (Loorbach, Frantzkeskaki, & Avelino, 2017). Moreover, a future research opportunity may include a better understanding of how specific configurations of BMS drive collaborations among actors and system change, by also investigating the social mechanisms (Hellström et al., 2015). In this sense, studies on specific typologies of BMS, such as servitizing BMS, BMS for the CE and sharing BMS, may explore what social changes will be required and what social relationships and networks among key actors are needed for a transition towards sustainability. For example, drawing on the idea of CE as a form of organization of social and economic exchange (Aspers, 2011), collaborative practices that support BMS in a CE and behavioural expectations about them may be investigated by future researchers.

BMs related to specific sectors may be enriched and expanded by exploring the social value they create, in addition to economic and environmental value, in a way to go beyond the traditional BMS (Brozovic, 2019). Further research in this sense may include how the specific kinds of BMS may contribute to the triple bottom line impact of business (Elkington, 1998).

Most of the existing studies present some limitations about the research context, such as a limited geographical setting, low amount of available data, limited investigated samples and short considered periods. Future research focusing on the main features of BMS for ES may overcome these limitations and try to advance research on larger samples and multiple territorial areas and may perform longitudinal studies. Critical case studies comparing successful with unsuccessful BMS for ES may complement existing research in this area.

4.2 | Research avenue no. 2: Theoretical perspectives

This study revealed how the BMS and ES area of research is mainly phenomenon driven rather than theoretical. These findings confirm the previous literature stating that BM research is theoretically underdeveloped (Teece, 2010; Zott et al., 2011). Taking into account the need to further develop this area of research through a theoretical perspective, we propose a new research avenue based on public values and transition towards sustainability, by adopting a stakeholder theory lens. The stakeholder theory states that values are part of doing business and rejects the idea that ethics and economics are separated (Freeman, 1994).

Future research may use the stakeholder theory to study BMS for ES with the aim to take into account not only environmental aspects but also societal outcomes (Breuer, Ludeke-Freund, & Brick, 2018). This could be particularly relevant as the stakeholder theory has been adopted by the management literature as crucial for the comprehension and the description of business and societal relationships (Wood & Jones, 1995). This theory helps to understand how different interests of external stakeholders generate pressures on companies to achieve both social and financial results (Donaldson & Preston, 1995). The higher level of theorization of BMS research through the use of the stakeholder theory might help to clarify the relationships among persons and companies, with the aim to understand stakeholders’ influences on business decisions (Maon, Lindgreen, & Swaen, 2010) and the social impacts of the organizations coming from their BMS. This objective is in line with the view that stakeholders cannot be treated exclusively as a means to business aims (Evan & Freeman, 1988). In this sense, a more inclusive consideration of people’s interests, in addition to business and corporate ones, will enable to consider BMS as a means to create public value in addition to economic value for a company. This will help to expand theoretical research on social BMS, which has actually received little attention (Spieth, Schneider, Clauß, & Eichenberg, 2019). The adoption of the
stakeholder theory to study BMs will clarify how companies share the value created and what is their responsibility towards stakeholders, by clarifying empirically and theoretically what differentiates social BMs from traditional ones (Spieth et al., 2019). This will elucidate how companies adopting BMs for sustainability want to do business and what typologies of relationships they should establish with their stakeholders to achieve their objectives (Freeman, Wicks, & Parmar, 2004). This proposed research avenue may help to acknowledge the impacts of business activities and strategies at a public level (Maon et al., 2010) and their contribution to a sustainable transition.

4.3 | Research avenue no. 3: Design of BMs for ES and organizational capabilities required

There is a restricted number of studies focusing on how companies may integrate sustainability into their BMs. One of the future research avenues may explore with concrete case studies on companies and how they do this integration, by also comparing different cases and thus expand the actual samples of studies. Moreover, future studies may also explore the integration of the company's social mission, in addition to the environmental ones, in their BMs. In particular, those studies may clarify the design and the redesign of firms activities and the integration of social value in products and services, including the value chain and the stakeholders (Speith et al. 2019), to better understand how this combination is organized. By doing this, future research will help to clarify not only how companies integrate environmental aspects in BMs, but also how social and ethical values become part of those BMs, and consequently, this will help to unpack if and how logic competing goals—environmental versus social (Jay, 2013; Mair, Mayer, & Lutz, 2015)—affect the BM design.

As the design and operation of BMs depend also on the firm’s capabilities, firm-specific knowledge and competencies are required to perform changes in companies. Our review found that the current literature devotes limited attention to the analysis of the organizational capabilities needed for BMs in the case of ES. Starting from the dynamic capabilities theory (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997), and taking into account the literature that states that BMs and dynamic capabilities are interrelated (Teece, 2018), we propose a future research avenue to explore what are the capabilities, resources and competencies that are required and that can be developed by firms to implement changes linked to BMs for ES. The theory of dynamic capabilities highlights the importance of internal and external firm competencies to reply to changing situations. By adopting this theoretical perspective, future studies may clarify the capacity to renew existing competencies and the role of strategic management in adapting organizational skills and competencies required by the changing environment linked to new BMs, like those for ES.

Another research avenue we propose in the area of organizational capabilities is to investigate the managerial cognitive dimension linked to BM for ES. There are many studies on cognition in the context of BM (Demil & Lecocq, 2015; Furnari, 2015; Martins, Rindova, & Greenbaum, 2015; Massa, Tucci, & Afuah, 2017; Täuscher & Abdelkafi, 2017), but few of them are related to the ES area.

Considering that the adoption of new BMs, such as those for ES, requires organizational changes, it is surprising that our review found no studies that explored the cognitive dimension linked to organizational adaptation. The relevance of managerial cognition in the context of organizational adaption and capabilities has been stated by the literature (Helfat & Peteraf, 2015; Teece, 2007; Tripsas & Gavetti, 2000). Studies on organizational cognition (Meindl, Stubbart, & Porac, 1994) emphasize the cognitive shortcuts that help actors to navigate uncertain or ambiguous situations, such as the implementation of new BMs. This literature stated factors of uncertainty that may characterize specific unknown situations. For this reason, actors should make sense of these uncertainties before they act, and in this framework, cognitive representations play a significant role in shaping their actions (Kaplan, Murray, & Henderson, 2003). Particularly, the organizational cognition literature emphasizes two aspects. First, actors have a general disposition to engage in sense-making—that is, the process through which an individual enacts a ‘relevant’ situation and interpret it. Second, the linkages between sense making and action are made up of cognitive maps—that is, stylized, mental representations of causally connected variables. According to this literature, we argue that organizational capabilities are not the only aspects that may influence the BMs adoption, and instead, the adoption is affected also by the managers’ cognitive maps. For this reason, we suggest that this stream of research may also explore the cognitive dimension and how managerial cognition may explain dynamic managerial capabilities in the area of BMs for ES. This opens up the possibility to investigate the cognitive maps that guide the behaviour of individual actors (Henry & Dietz, 2012), in terms of engagement with this kind of BMs.

4.4 | Research avenue no. 4: BMs and performance

The review found that studies on BMs and performance are quite important. Linking BMs for ES with performance is pivotal in addressing whether and how they create value.

One of the key research opportunities in light of the UN sustainable development goals (SDGs) is to develop studies on BMs to address not only environmental and economic issues but also societal challenges (Breuer et al., 2018; Coccuyt, Crucke, & Slabbinck, 2020). In particular, SDG 17 aims to direct efforts of multiple actors—business included—to deal with social problems involving present societies (Calabrese et al., 2018). BMs can be further explored as an alternative concept of doing business that goes beyond the creation of economic value for a company, in a form that determines value for the society (Meyskens, Robb-Post, Stamp, Carsrud, & Reynolds, 2010) and generates public value (Nicholls, 2009). Interestingly, there is recent research about redefining the nature of the firm towards human purposes (Mayer, 2018) that is yet to be aligned with ES. Common themes to start with could address energy poverty, access to clean water,
affordable and low-carbon housing and climate catastrophes (Hahn, 2012). This research gap originates from a tension between creating value at a social level and capturing value at a private (business and organizational) level (Smith, Gonin, & Besharov, 2013; Spieth et al., 2019). Some scholars have stated this kind of tensions between the two (Chowdhury, Gruber, & Zolkiewski, 2016; Ritala & Hurmelinna-Laukkana, 2009), seeing a contradictory yet interrelated relationship between value creation and value capture (Niesten & Stefan, 2019).

Tensions can depend on conflicting mechanisms related to create or to capture value (Niesten & Stefan, 2019). For example, value creation at a social level takes into account the opportunity ‘to create social value by stimulating social change or meeting social needs’ (Mair & Marti, 2006, p. 37), whereas value capture at a private level requires appropriation mechanisms (Veer, Lorenz, & Blind, 2016) at the managerial level (Capaldo & Petruzelli, 2011).

We suggest to further explore the relationships among value creation at a social level and value appropriation at a private level. This new research avenue may clarify how companies pursuing economic value through green BMs and strategies may also create public value and maintain a competitive advantage at the same time. This stream of research is in line with the view of a systemic business transformation to achieve sustainability at a wider level (Loorbach, van Bakel, Whitteman, & Rotmans, 2010; Loorbach & Wijssman, 2013). By contributing to social value, business will be able to participate in systemic challenges involving multiple actors (business, government, civil society) in order to accelerate the process towards sustainability. This stream of research will also address the existing lack of research on business practices aiming to modify the way societal systems act to overcome environmental and social issues (Starik & Marcus, 2000). Future studies on this area may help to clarify the position of organizations in the context of a broader system and define their role in contributing to systemic change to achieve sustainability outcomes at a wider level.

The research we propose aiming to understand how BMs can be an alternative concept of doing business can help to advance knowledge on how BMs for ES can address sustainability through the triple bottom line perspective, containing the economic, environmental and social dimensions (Joyce & Paquin, 2016). In addition, this new field of research may help to clarify how organizations generate various types of value—economic, environmental and social. As part of this proposed stream of research, BMs can be explored also as a means of social profit generation, other than a financial profit generation (Yunus et al., 2010).

5 | CONCLUDING REMARKS

The novel contribution of this paper is, to the best of our knowledge, the first comprehensive and systematic review of the studies on BM in the area of ES. In light of future challenges, the relevance is high due to increasing requests from multiple stakeholders towards corporate change, as well as from business recognizing green opportunities. Thus, the key to successful BMs is to create environmental and social values and to appropriate a share of such values for businesses. Taking into account this key message, our attempt at reviewing existing literature recognizes different knowledge gaps regarding the social dimensions, opportunities and values of BMs for ES. By identifying some research avenues, our paper should encourage more comprehensive research on BM that could support social and economic transformations, companies and policies in a way to create public values. The proposed research opportunities, by contributing to the BMs body of knowledge, may also support practitioners to understand how they can contribute to a more sustainable society through their BMs. Stressing such research perspectives, we also underline the value for managers, for policymakers and for planners. We believe that this area of research will continue to grow and could contribute to the wider debate on how business shapes markets and societies towards sustainability. One limitation of this study is that we have considered only some research streams. Future researchers may identify additional research streams in the papers dealing with BMs for ES and suggest how gaps of those streams can be addressed through further analysis. For example, some subareas we identified within a research stream could be explored more in depth as individual lines of research, considering the growing research on the topic. This could be the case of BMI, for example, as it represents a key topic in the area of BMs for ES. Taking into account our findings, future studies may explore, for example, how BMI could contribute to a sustainable society. Another limitation of our study is that we based our research on a unique database; even if ISI Web of Knowledge SSCI is considered as one of the most complete databases including peer-reviewed journals in the area of social sciences, we have not considered other databases, such as Scopus.

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