

Investigating the entrepreneurial orientation of circular-social hybrid start-ups by assessing their path toward sustainability: Evidence from 20 European cases

Charleen von Kolpinski^a, Enrico Cagno^b, Alessandra Neri^{b,*}

^a Technische Universität Berlin, Department of Entrepreneurship & Innovation Management, Straße des 17. Juni, 135, 10623 Berlin, Germany

^b Politecnico di Milano, Department of Management, Economics, and Industrial Engineering, Via Lambruschini 4b, 20156 Milano, Italy

ARTICLE INFO

Editor: Prof. Konstantinos Tsagarakis

Keywords:

Start-up
Entrepreneurial orientation
Business model
Sustainability
Circular economy
Leverage points

ABSTRACT

Circular-social hybrid start-ups have a remarkable potential to create environmental, social, and economic value. Despite their relevance for the sustainability transition, there is a dearth of literature analysing their entrepreneurial orientation and how they create environmental and social value in their business models. Therefore, the present study, framed in the theory of entrepreneurial orientation, empirically assesses the dynamics of creating positive sustainable value by aligning the initial orientation with the sustainability activities and performance. The research is conducted through semi-structured interviews with the founders of twenty European start-ups. The study shows that circular-social hybrid start-ups have a strong sustainability orientation, but some display difficulties in achieving their initial mission. This entrepreneurial path from mission to reality is identified by uncovering business model dynamics and leverage points: scale-up and growth, use of digital solutions, improvement of working conditions, research and development, and alignment of business processes. These leverage points influence the potential mission drift of the start-up, i.e. its deviation from the path to sustainability. Entrepreneurs can use this study to identify leverage points to support their path toward sustainability.

1. Introduction

Start-ups are innovative and agile ventures that can effectively target new objectives, such as sustainability impacts, by integrating environmental and social measures into their core economic business models and by adopting new operational paradigms, such as the circular economy (Urbinati et al., 2017). Business models that simultaneously integrate circular and social measures adopt a hybrid approach and aim to generate positive environmental and social impact (Jaeger-Erben et al., 2021). These circular-social hybrids are defined as “financially self-sustaining while applying a mix of circular and social business models” (Kolpinski et al., 2023). Their business models differ from pure circular business models (CBMs) or social business models (SBMs) by integrating both, that is they either operate a CBM with a clear social component or have a social objective to be achieved through a circular economy approach. In this way, new and innovative business models are created aiming to solve environmental and social problems through new means of circular economy accompanied by social practices. They also aim to generate high revenues to be used for reinvestment and to

become financially self-sustaining (Kolpinski et al., 2023).

Such hybrid organisations need to simultaneously balance different organisational logics with economic, environmental, and social objectives (Battilana and Dorado, 2010; Elkington, 1994; Mair and Marti, 2006). Despite the calls for integration (Ferasso et al., 2020), the research on CBMs often neglects social components (Geissdoerfer et al., 2017; Kristensen and Mosgaard, 2020; Mies and Gold, 2021) which are nevertheless necessary to maximise sustainability impact (Nikolaou and Tsagarakis, 2021; Walker et al., 2021). Indeed, according to the triple bottom line model proposed by Elkington (1994), sustainability lies at the intersection of three different dimensions, namely economic, environmental, and social. Therefore, creating sustainability impacts means creating positive outcomes in the three dimensions.

The present study aims to advance the current knowledge by answering the following research question: *How do circular-social hybrid start-ups target and follow their path toward sustainability?*

The entrepreneurial orientation of founders of circular-social hybrid start-ups is characterised by their ability to recognise and act on opportunities to start a business with clear sustainability objectives (Cullen

* Corresponding author.

E-mail address: alessandra.neri@polimi.it (A. Neri).

<https://doi.org/10.1016/j.spc.2024.03.036>

Received 15 December 2023; Received in revised form 30 March 2024; Accepted 30 March 2024

Available online 5 April 2024

2352-5509/© 2024 The Authors. Published by Elsevier Ltd on behalf of Institution of Chemical Engineers. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

and De Angelis, 2021). The initial entrepreneurial orientation determines a prioritisation of sustainability dimensions, but this might change over time due to external and internal barriers (Kolpinski et al., 2022; Neri et al., 2021). Therefore, following the pathway toward sustainability raises questions about the actual impacts start-ups create, which can be assessed using sustainability performance indicators. By comparing the sustainability orientation of the start-up with the sustainability impacts created, we can conclude the interrelationship between the business model, the circular and social objectives, and the actual sustainability impacts. This analysis leads to a better identification of the dynamics of circular-social business models and the identification of leverage points where start-ups potentially deviate from the sustainability path and risk mission drift. More specifically, mission drift occurs when the start-up deviates from its original mission, leading to a change in the business model due to external or internal pressures (Van der Byl and Vredenburg, 2015). In the context of hybrid organisations, it often means a shift from the initial social or environmental focus of the business model to achieving financial goals (Van der Byl and Vredenburg, 2015). Leverage points, which are priority points for system interventions where small changes can lead to a large transformation of the same system (Chan et al., 2020), can help to understand how start-ups achieve their sustainability mission and, if not, what business model dynamics lead to mission drift.

By exploring how circular-social hybrid start-ups pursue their sustainability mission and path, the paper aims to identify the leverage points to reveal the business model dynamics that deviate from the initial sustainability orientation. Literature on circular-social hybrid start-ups is relatively scarce (OECD, 2022); however, drawing on the existing knowledge on circular start-ups (Van Opstal and Borms, 2023) and social start-ups (Kamaludin, 2023) the said circular-social hybrid start-ups can be recognised as prime examples of sustainability impact.

The remainder of the paper follows. After a literature background on entrepreneurial orientation from a business model perspective in the context of sustainability impact and a characterisation of circular-social hybrid start-ups (Section 2), the methodology for the empirical investigation is presented (Section 3). The results are then reported and discussed (Section 4). By identifying the leverage points and logic behind sustainability implementation in the business context of start-ups, conclusions are offered in terms of contributions for academics and practitioners (Section 5).

2. Literature review

This section reviews relevant literature to introduce the concept of entrepreneurial orientation in the context of sustainability (Section 2.1) and defines circular-social start-ups with their unique hybrid business models (Section 2.2). Finally, it covers the main emerging gaps in the literature, thus justifying the purpose of this paper (Section 2.3).

2.1. Entrepreneurial orientation in the context of sustainability

Start-ups are key drivers of entrepreneurial development and are known for disruptive innovation and unique business models (Hockerts and Wüstenhagen, 2010). They are new market entrants operating for less than six years (Zahra et al., 2000), so they tend to be young and small companies (Hockerts and Wüstenhagen, 2010), but also independent with their entrepreneurial business model (Henry et al., 2020). Start-ups are typically characterised by informal and fast-moving work and management structures, lack of resources, volatility in the business model and value chain, newness to the market, and lack of specific knowledge (Trautwein, 2021).

Start-ups are created by entrepreneurs. When entrepreneurs recognise an opportunity, they design organisational structures by developing a business model to enable the exploitation of (commercial) opportunities (George and Bock, 2011) through the effective use of resources (Filion, 2011). Entrepreneurial orientation is the ability to recognise

opportunities and initiate a set of activities to exploit them (Cullen and De Angelis, 2021). Activities are defined as the commitment of human, physical and/or capital resources to serve the purpose of the business model (Zott and Amit, 2010). Entrepreneurially oriented firms are innovative, proactive, and risk-taking in complex and volatile external environments (Andersén et al., 2015; Cullen and De Angelis, 2021), but they do not automatically generate economic value or become successful (Wales, 2016). To determine the economic value of a business model, the following can be considered, namely value proposition, value creation and delivery, and value capture (Richardson, 2008), and the same is valid for impact start-ups as for circular start-ups (Kolpinski et al., 2022; Lüdeke-Freund et al., 2019).

More and more start-ups show a high potential to solve social and environmental problems innovatively, thus creating social and environmental value in addition to economic value (Hall et al., 2010; Hockerts and Wüstenhagen, 2010). Compared to incumbents, start-ups have the advantage of building a new business model and being relatively flexible in adapting it based on learning and market reactions (Böckel et al., 2023; Kuhlmann et al., 2022). They can experiment in their early stages with a combination of environmental, social, and economic creation without having to change existing traditions, systems, and structures (Bocken, 2015; Bocken et al., 2018). Start-ups with an entrepreneurial orientation toward sustainability can thus establish certain activities and embed them as processes in their business models to achieve specific sustainability outcomes (Dembek et al., 2023). However, there is no guarantee that a strong sustainability orientation will automatically lead to a sustainable business model and sustainable value creation (Fichter et al., 2023), especially when considering the different system levels and contexts, namely the micro level (individual enterprise), the meso level (stakeholder network of enterprises) and the macro level (society, economy and politics) (Fichter et al., 2023; Johnson and Schaltegger, 2020; Nikolaou and Tsagarakis, 2021).

The triple bottom line model is widely used to assess the sustainability impact (Evans et al., 2017). Measuring the sustainability impact of start-ups is associated with many challenges due to the lack of historical data, uncertainties and unforeseen changes in the external environment that may affect the business model (Trautwein, 2021). Overall, assessing the impact of start-ups could identify challenges and trade-offs in decision-making (Fichter et al., 2023). Thus, assessing performance is only the first step toward identifying the dynamics of establishing structures, processes, and activities for sustainable value creation, hence business models, in so-called circular-social hybrid start-ups.

2.2. Characterising born circular-social hybrid start-ups

Kolpinski et al. (2023) define circular-social hybrid enterprises as those that operate in a way that ensures financial autonomy while employing a mix of circular and social business models. Circular-social hybrid start-ups can thus be recognised as a hybrid organisation that simultaneously addresses multiple environmental and social aspects to generate economic wealth. In this paper, we consider born circular-social hybrid start-ups to fulfil both definitions of CBMs and SBMs.

Circular-social hybrid start-ups are characterised by a strong entrepreneurial orientation to create sustainable value (Kolpinski et al., 2023). Indeed, the central component of entrepreneurially oriented firms is their high degree of innovativeness through their ability to generate ideas and business growth, especially in complex, uncertain and volatile external environments (Cullen and De Angelis, 2021). This description of a highly entrepreneurial enterprise applies to circular-social hybrid start-ups, as they directly target these environments and aim at system transformation (Kolpinski et al., 2023).

The overarching goal of CBMs is to reduce waste and consumption while using resources in multiple cycles to create value (Lüdeke-Freund et al., 2019). Together with their partners, circular enterprises innovate to create, capture, and deliver (economic) value to achieve

environmental, social, and economic benefits (Frishammar and Parida, 2019). Different types of CBMs have been described in the literature: waste-based, design-based, platform-based, service-based, and nature-based (Henry et al., 2020). Specifically, waste-based CBMs implement recycling or recovery strategies; design-based CBMs focus on the reduction strategy and aim to increase use efficiency; platform-based CBMs pursue business models around marketplaces using technologies; service-based CBMs transform products into services and increase use efficiency by transforming customer ownership; nature-based CBMs are regenerative and provide nature-based solutions. Circular start-ups show a high degree of embeddedness, thus creating value for the broader system in which the start-up operates (Cullen and De Angelis, 2021). Although sustainability and circularity are two concepts often associated (Geissdoerfer et al., 2020; Padilla-Rivera et al., 2020), it has been shown that CBMs may not automatically lead to sustainability outcomes (Padilla-Rivera et al., 2020; Walker et al., 2021). From this standpoint, previous research has called for a deeper understanding of the relationship between circular start-ups and their social sustainability impacts (Centobelli et al., 2020; Suchek et al., 2022; Walker et al., 2021). Fichter et al. (2023) invite future research to differentiate these terms to assess the sustainability impacts of entrepreneurship in different contexts more accurately.

A SBM is characterised by a willingness to trade off certain aspects of value creation (the economic value generated for the focal firm) in favour of enhancing societal value for its various stakeholders, including the wider community (Gauthier et al., 2020), for example by finding solutions to societal problems (Defourny, 2001). A SBM is about exploiting market opportunities to serve disadvantaged people while creating social and economic value (Dees, 2012; Defourny, 2001; Jin, 2019).

Circular-social hybrid start-ups thus apply unique business models by combining different institutional logics, i.e. different goals, in novel ways (Battilana and Dorado, 2010). Hybrid start-ups have a multifaceted mission to create non-monetary environmental and/or social value through activities to generate profit (Gupta et al., 2020). They use circular economy measures to support the environmental dimension, integrate social activities to create a clear positive social impact, and secure revenue streams to enable long-term survival. Therefore, circular-social hybrid start-ups incorporate all three dimensions of sustainability according to the triple bottom line model (Elkington, 1994) and have great potential to achieve high sustainability impact. Start-ups founded to create positive impacts for the environment and society can be referred to as ‘born’ circular-social start-ups (Böckel et al., 2023; Han et al., 2023).

2.3. Emerging gaps

The centre of the current debate is on exploring the success factors of sustainability-focused start-ups and the role of resources and activities. This implies the investigation of the role of business model development, as business models enable different sustainability outcomes in a structured way with planned resources and activities. Methods to monitor and evaluate impacts are a major gap, especially for early-stage start-ups (Cagarman et al., 2023), and Fichter et al. (2023) highlight the gap in evaluating the sustainability impacts of start-ups. Furthermore, the current debate is mainly focused on the enterprise, whereas a shift in the unit of analysis is needed to focus on the design, evolution, and dynamics of business models (Lüdeke-Freund et al., 2021). Additionally, Wales (2016) advocates for qualitative research in entrepreneurial orientation from an entrepreneurial organisational standpoint, aiming to understand how ventures effectively experiment with new business models to foster firm growth.

There is also a need to better characterise born circular-social hybrid start-ups, especially in terms of the intersection of circular and social aspects (Kolpinski et al., 2023). Overall, there is a lack of empirical research on born circular start-ups (Böckel et al., 2023; Suchek et al.,

2022) and the assessment of their sustainability impact (Ferasso et al., 2020; Suchek et al., 2022). Indeed, understanding the impact of the circular economy on people and society is still an open research area in general (Mora-Contreras et al., 2023; Cagno et al., 2023; Valencia et al., 2023), and especially in start-ups. The triple bottom line needs to be analysed to understand the real impact generated by the circular-social hybrid start-ups, while also understanding how environmental and social dimensions are linked in business practices (Homrich et al., 2018). The assessment of impact includes the development of measurement tools and comparative indicators (Kolpinski et al., 2023). Circular-social hybrid start-ups have great potential to create a sustainability impact scenario that includes the three dimensions of sustainability (Ferasso et al., 2020), yet there is no comprehensive list of micro-level sustainability performance indicators, particularly for assessing their impact (Kristensen and Mosgaard, 2020). Further research is therefore needed from this perspective, also considering that impact assessment can be a driver for the development of start-ups and the creation of positive sustainability impacts (Fichter et al., 2023).

The discussion on business models and the impact of business models on sustainability has been invited to move beyond the static view of forms and types of business models to focus on entrepreneurial activities, processes and dynamics related to their implementation (Cullen and De Angelis, 2021; Frishammar and Parida, 2019; Geissdoerfer et al., 2020). Investigating the initial entrepreneurial orientation of start-ups is crucial to capture possible tensions between sustainability dimensions, especially in the case of hybrids (Kolpinski et al., 2023).

To address the aforementioned gaps, this paper aims to analyse entrepreneurial orientation, activities, processes, and sustainable value created by investigating business model dynamics to identify leverage points in business models, underlining potential tensions between the value creation of the three sustainability dimensions to avoid mission drift. Leverage points can occur anywhere in a complex system, such as a business, where a small change can lead to a major transformation (Meadows, 1999). According to Chan et al. (2020), leverage points are priority points for system interventions, and they represent competent heuristic and practical tools for sustainability science (Fisher and Riechers, 2019).

3. Methods

A multiple case study approach was used, building on grounded theory (Eisenhardt, 1989). The aim is to build theory from multiple cases to explain a particular phenomenon, so it is about exploring relationships and connections in the data that are supported by theoretical arguments (Eisenhardt, 2021). To explore new insights into a phenomenon, grounded theory calls for open-ended research questions that explore, for example, processes and dynamics (Eisenhardt, 2021). The research question of this paper is open-ended and asks about the processes and dynamics of business model development for sustainability over time. Given this and the lack of prior research on the topic, an exploratory multiple-case study approach is adopted (Mills, 2010). Case study is the preferred research method for generating knowledge relevant to management (Gibbert et al., 2008). This research is designed to conduct within-case and cross-case analyses to compare cases within and among each other (Palomares-Aguirre et al., 2018). The main source of primary data consists of semi-structured interviews. According to Eisenhardt and Graebner (2007), conducting interviews is a valid method for a qualitative research setting. Fig. 1 gives an overview of the methodological steps. The steps are not separate from each other, but they bring an order to the following research design in terms of case selection, data collection and data analysis.

3.1. Case selection

The study employed a theoretical sampling strategy consistent with the multiple case study approach (Eisenhardt, 1989). In grounded

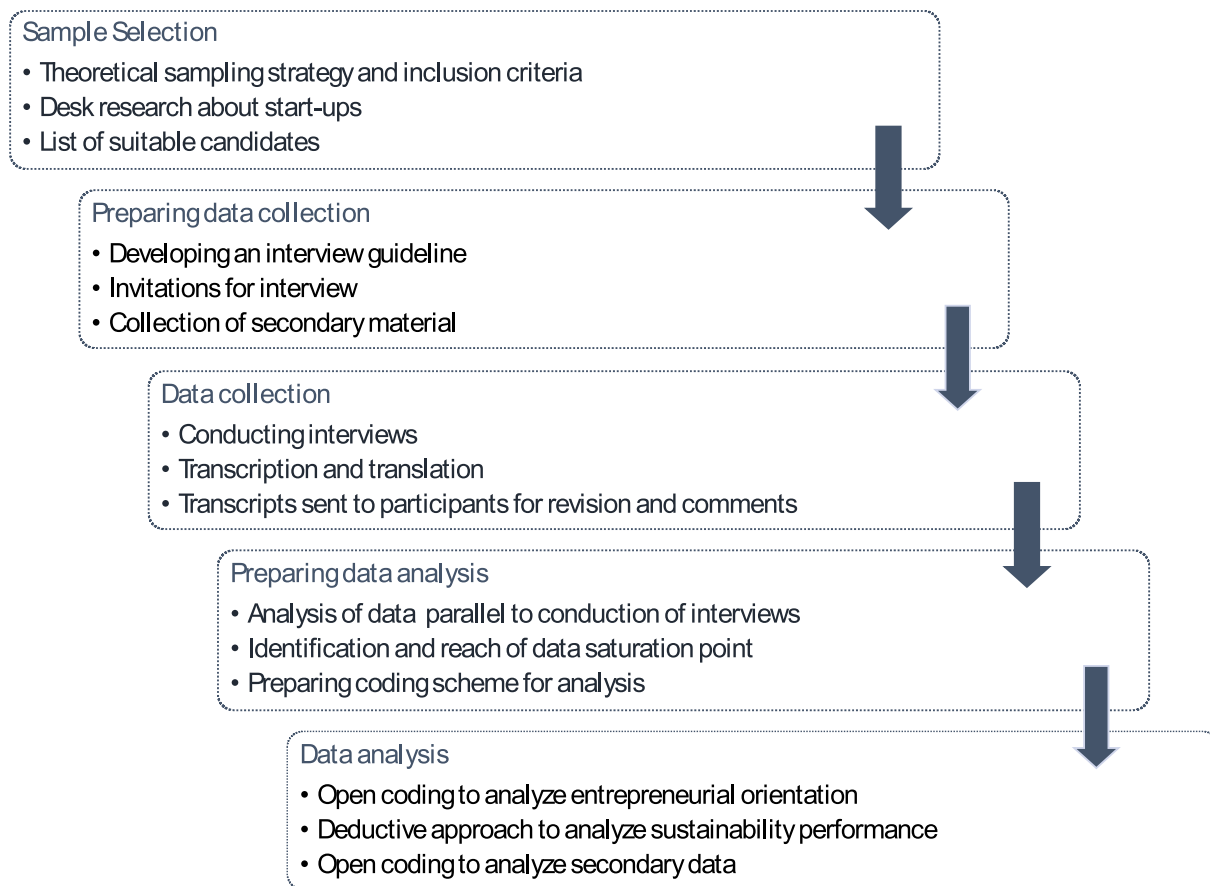


Fig. 1. Methodological flowchart.

theory, it is customary to select cases with common antecedents because seemingly similar cases have a high potential to reveal different processes or outcomes (Eisenhardt, 2021). Cases where the phenomenon of interest is likely to occur should be selected to study that phenomenon (Eisenhardt, 2021). This paper investigates start-ups with an entrepreneurial orientation that solve sustainability challenges by exploiting business opportunities. Sustainability, as defined by Nikolaou and

Tsagarakis (2021), involves implementing the triple bottom line approach. The cases meet the criterion of combining common antecedents, but they are still very innovative and unique in their approaches and business models. The second inclusion criterion is that the start-ups apply a born-CBM with a vision for sustainable impact and social practices or a born-SBM with circular practices, hence they are born-circular-social hybrid start-ups. Additionally, all start-ups must be

Table 1
Description of the sample.

Start-up ID	Interviewee	Founded in	Country	Employees	Sector
SU1	Founder/ CEO	2017	Italy	15	Fashion
SU2	Head of Sales	2018	Italy	27	Fashion
SU3	Founder & CSR Manager	2012	Netherlands	12	Fashion
SU4	Founder/ CEO	2019	Netherlands	9	Promotional gifts
SU5	Co-founder/ CEO	2017	Germany	35	Plastics
SU6	Co-founder/ Chairperson	2021	Germany	5	Food & Beverage
SU7	Co-founder/ CEO	2019	Italy	5	Food & Beverage
SU8	Co-founder	2020	Italy	2	Fashion
SU9	Co-Founder/ CEO	2019	Italy	11	Fashion
SU10	Co-founder/ CSM	2019	Germany	18	Plastics
SU11	Chairperson	2022	Austria	1	Construction
SU12	Co-Founder/ COO	2020	Germany	18	Platform
SU13	Co-Founder/ CEO	2021	Italy	5	Cosmetics
SU14	Co-Founder/ CEO	2021	Germany	6	Packaging
SU15	Co-Founder/ CEO	2020	Italy	4	Agriculture
SU16	Founder/ CEO	2016	Sweden	1	Packaging
SU17	Managing Director	Foundation phase	Germany	1	Fashion
SU18	Co-Founder/ CEO	2020	Germany	1	Food & Beverage
SU19	Co-Founder/ CEO	2019	Germany	72	Plastics
SU20	Co-Founder/ CMO	2022	Austria	4	Hospitality

Legend. CEO – Chief Executive Officer. CSR – Corporate Social Responsibility. CSM – Chief Sustainability Manager. CMO – Chief Marketing Officer. COO – Chief Operating Officer.

founded in the European Union or in countries with comparable economies, such as Germany, Netherlands, Italy, Austria, and Sweden, to ensure comparability. Start-ups that met the inclusion criteria were identified through desk research on the internet, including company websites, LinkedIn profiles, and start-up competitions. A list of potential interview candidates was created, and they were invited via email or direct LinkedIn messages for an online interview lasting approximately 45 to 60 min (Voss et al., 2002). Given the nature of the organisations, which tended to be small and young, each case involved interviewing the founder or managing director (Ciccullo et al., 2023). Additional desk research was conducted to gather secondary data, including company websites, reports, sustainability reports, life cycle assessments, and external certifications such as B Corp.

Table 1 provides an overview of the investigated start-ups. Most participants are for-profit start-ups up to seven years old with an average age of 3.75 years at the time of data collection. However, some exceptions should be noted. SU3 is a more mature and scalable enterprise, but with its born-CBM, it is a perfect candidate for the research; SU6 and SU11 are co-operatives; SU11, SU16, SU18 and SU17 do not employ people at the time of the interviews, although the founders are completely involved, freelancers and volunteers work for them and they plan to grow the business and employ people shortly; SU2 and SU19 employ most of their staff outside Europe in their project offices. The start-ups either manufacture products or provide services and are active in several different sectors.

3.2. Data collection

A flexible interview guideline (see supplementary information S1) was designed to collect free comments and allow for additional questions to emerge during the conversation (Hofmann and Jaeger-Erben, 2020). Before conducting the interviews, the researchers reviewed publicly available documents about the enterprises to prepare for each interview and ask more in-depth questions about the specific business model (Palomares-Aguirre et al., 2018). Invitations were sent out to potential participants, resulting in twenty interviews conducted between October 2022 and February 2023. All interviews were conducted digitally via Zoom, with one interview in Italian, four in German, and fifteen in English.

The interview consisted of three parts. The first part focused on understanding the business model, including the value proposition and internal processes. The second part of the interview deepened the understanding of the vision of the company and the stakeholders of the business model. The third part focused on sustainability targets, performance indicators, and areas of improvement to increase sustainability impact. The interviewees ranked the triple bottom line dimensions for their relevance (1 = low; 2 = medium; 3 = high) concerning the start-up's sustainability targets and created impact. The assigned relevance was justified and supported by further discussion.

All interviews were recorded with the interviewees' consent. The transcriptions were sent back to the interviewees for their comments or additions. In certain instances, follow-up questions were posed via email. The transcripts of the Italian and German interviews were translated into English using the DeepL software.

3.3. Data analysis

The authors analysed interview transcripts simultaneously with the interviews themselves. They found that data collection reached saturation after twenty interviews. The authors corroborated insights from the transcription analysis with secondary data, including field notes (Antikainen and Valkokari, 2016). Finally, coding schemes were developed for different parts of the interviews. The study employed an inductive approach and open coding to analyse questions related to entrepreneurial orientation and secondary data, which is a technique based on grounded theory (Corbin and Strauss, 1990; Eisenhardt, 1989). A

deductive approach was used to analyse the business models according to Cullen and De Angelis (2021) and sustainability performance indicators following the coding scheme of Cagno et al. (2019).

For the inductive part, the transcripts underwent open coding and codes were subsequently organised in different iterations. Codes were then grouped into more abstract conceptualisations to enable comparisons between theory and data (Eisenhardt, 2021). An inductive template was created for the analysis of the interviews on sustainability targets, the actual impact created, measurement of impact, and self-reported areas of improvement for sustainability impact. This coding template was adapted during several data sessions in which the authors discussed the coding structure. An example of the data structure is provided in supplementary information S2, TableS2 and supplementary information S3, FigureS3. The results of this analysis are explained in Section 4.2.

The business models were deductively analysed using Cullen and De Angelis (2021)'s framework which focuses on understanding the entrepreneurial value proposition, creation and delivery, and capture. Furthermore, each start-up was assigned a CBM type according to Henry et al.'s (2020) classification. To measure the sustainability impact, a coding scheme based on Cagno et al. (2019)'s model was employed. However, it should be noted that said model was developed specifically for manufacturing firms, despite being considered a comprehensive tool for assessing sustainability performance. Based on the data analysis results, we considered the option of expanding the list of performance indicators in the model to better align with any specificities identified in our sample. Sustainability performance indicators are evaluated to elaborate on possible misalignments of targets and actual impact. The authors identified leverage points for sustainability in business models through an inductive analysis of common features and patterns found in the analysis of business models, sustainability goals, impacts and areas of improvement. Fig. 2 illustrates the flow of processes involved in starting a circular-social hybrid venture, including setting targets, creating the business model (including entrepreneurial value proposition, creation, delivery, and capture), and measuring the actual impact in the economic, environmental, and social dimensions: the flow was used as a scheme for the performed analysis.

4. Results and discussion

The section presents and discusses the results of the study. An overview of the circular-social hybrid business models is provided (Section 4.1), followed by the sustainability orientation and value created (Section 4.2), the sustainability impact measurement (Section 4.3), the reported areas of improvement (Section 4.4), and the leverage points in the business models to increase their sustainability impact (Section 4.5). Final remarks are then offered (Section 4.6).

4.1. Circular-social hybrid business models: overview of the sample investigated

Using the framework proposed by Cullen and De Angelis (2021), the entrepreneurial value of start-ups was identified in terms of value proposition, creation, delivery, and capture. Of the 20 start-ups analysed, 15 offer products and 5 offer services. Consequently, revenue streams for entrepreneurial value capture differ, consisting mostly of selling products and receiving fees for leasing, renting workshops, and membership. The start-ups sampled were also classified according to the types proposed by Henry et al. (2020). Interestingly, the investigated start-ups were largely classified as mixed types, as they considered different sustainability orientations to be equally relevant (see Section 4.2). Therefore, all relevant categorisations are applied. For instance, SU4 utilises a combination of waste- and design-based CBMs. They employ waste materials to design and manufacture their products for each order while obtaining secondary materials from customers or by-products or wastes from industrial partners, which make up their materials catalogue. SU4's value proposition centres on reducing materials

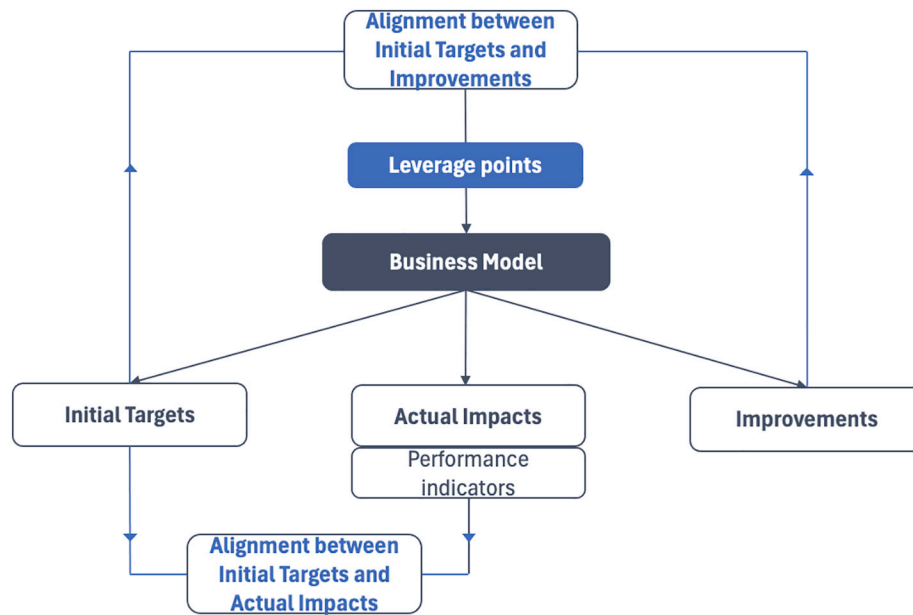


Fig. 2. Scheme of the performed analysis.

Table 2

Entrepreneurial value proposition, creation and delivery, and capture of the sampled start-ups. Start-ups are organized according to the value proposition, i.e. product or service.

Start-up ID	Value proposition	Value creation and delivery	Value capture	CBM type(s)
SU1	Products Fashion items of recycled garments	Take-back & collection system, recycling of garments, production, sale	Sale of products	Waste; Design
SU2	Products Fashion items and home decor	Design & prototype, fabrics sourcing & production, online sale	Sale of products	Design
SU4	Products Promotional gifts	Products from waste materials, sale, or pre-order	Sale of products	Waste; Design
SU6	Products Supermarket run by members of cooperative	Ordering products, managing & involving community, administration, financials, deposit system	Sale of products	Waste; Design
SU7	Products Beer and snack bars	Sourcing of surplus bread from bakeries or supermarkets, local beer brewery, snack bars from surplus of brewery process	Sale of products	Waste; Design
SU8	Products Fashion items from by-products of marble industry	R&D to develop materials from marble by-products, design collections, marketing	Sale of products	Waste; Design
SU9	Products Fashion items of recycled garments	Circular design, local production, packaging, take-back & tracking of items	Sale of products	Waste; Design
SU10	Products Trash & shipping bags from recycled plastics	Partnering with local collection organisations & recyclers, material testing, sales, marketing	Sale of products	Waste
SU13	Products Cosmetics from agricultural fruit wastes	Product development, sourcing, selling, partner network	Sale of products	Waste
SU15	Products Network of local agricultural companies and retail of products	Fair ordering from local farmers, improving their sustainability practices, packaging, sales, network farmers & consumers	Sale of products	Service
SU16	Products Bee wax fabric to keep food fresh for storage	Ordering bee wax & reused fabrics locally, managing production, sales	Sale of products	Waste; Design
SU3	Products Fashion items of recycled garments	Take-back, recycling of garments, production, sale, leasing option	Sale & lease of products	Waste; Design
SU20	Products Circular mattresses with leasing option	Circular design of mattresses, managing production, logistics, sale, tracking, take-back & refurb	Sale & lease of products	Design; Service
SU17	Products Fashion items from recycled garments	Design, production, sales, take-back system, receiving large quantities of secondary materials	Sale of products & service fee	Waste; Design
SU18	Products Cereals stations in offices; Service: maintenance, etc. Leasing option	Design & production of stations, ordering cereals, nutritional concepts, individual customer journey for refilling & maintenance	Sale of products & services	Design; Service
SU11	Service Planning & managing circular deconstruction projects	Planning of deconstruction projects, removing reusable materials by socio-economic companies, selling materials from components catalogue	Sale of services & secondary materials	Waste
SU12	Service Pick-up & selling items of households on online marketplace	IT development with automated system for marketplace, pick-up & sales service	Sale of products & sales fee	Platform; Service
SU5	Service Waste compensation	Partner organisations supporting projects, river clean-up technology, carry out projects	Service fee	Waste; Service
SU14	Service Rental of shipping boxes, bags & software solution (SaaS)	Customer support, managing rentals & logistics, development of IT solution for tracking	Lease of products	Service
SU19	Service River clean-ups from plastic waste in developing country with local branches	Hiring staff for local sites, permission of local authorities, building clean-up technology, rent local spaces, recyclers, sales	Sale of products & membership fee	Waste; Service

Legend CBM: Circular Business Model.

usage, including packaging, and maximising efficiency. By producing locally in the Netherlands, SU4 significantly reduces carbon emissions related to the transportation of materials, production, and sale of goods within Europe.

There is a deviation in entrepreneurial value creation and delivery among different CBM types. Waste-based CBMs, such as SU1, SU3, SU8, SU9, and SU17, are mostly based on reusing, recycling, or upcycling waste materials in the fashion industry. Waste materials can originate from the same sector, such as worn-out fashion items, or be collected from start-ups through collection and take-back systems. In some cases, waste materials can come from different sectors, as is the case with SU8. SU8, indeed, uses by-products from the marble industry to produce fashion items using patented technology. Design-based CBMs aim to minimise primary material usage for their products, packaging, etc. through efficient design and production processes, product life extension, and design for recycling. An example of this is SU20's development of modular mattresses. SU20 established a take-back system for worn-out mattresses to facilitate recycling. Additionally, leasing options for hotels ensure that mattresses are returned, facilitating tracking and reuse through the adoption of a product passport. Service-based CBMs enable customers to purchase a service rather than a product, increasing the usage efficiency of physical products. For instance, SU14 provides shipping boxes for online retailers to rent. Their software solution allows for easy tracking of the boxes, and a deposit scheme ensures that the final customers return the boxes for reuse in the next order. SU12 is the only platform-based CBM in this sample and it operates an online platform for private individuals to buy and sell used household items, such as fashion items or electronic devices. They offer the service of collecting the items from the sellers' homes, using an artificial intelligence-based solution to decide whether to sell the individual items (on their own or other marketplaces), donate them to non-governmental organisations, or sell the garments to upcycling producers. All sampled start-ups demonstrated a strong entrepreneurial focus on sustainability, as they have identified business opportunities that can be addressed with innovative circular and social business ideas (Filion, 2011). Table 2 displays the business models of the investigated start-ups.

4.2. Sustainability orientation and value created

The investigated start-ups have different sustainability orientations, as indicated by the respondents. Some start-ups focus on environmental targets to contribute to a positive sustainable impact by applying a CBM, such as SU1, SU3, SU12, and SU20. For example, the founder of SU1 shares their purpose by stating:

“Our reason is that every waste is a resource.”
(SU1)

However, social purposes can also be achieved by applying a CBM, as in SU5 and SU7:

“We are a social impact company because the circular economy is the way we do it. But what we are doing is social impact, and that's what we want at the end of the day. We want to have more food for people, more healthy food for people, less waste for everybody.”
(SU7)

This suggests that the CBM, with its environmental and economic benefits, is being used to achieve the goal of the start-up which is social impact. Combinations of social purpose with circular, environmental, or sustainable ones were also reported, while others considered a focus on sustainability, often explained as mixed or even intertwined social and environmental goals, as in the case of SU4, SU18, and SU19:

“For me, sustainability is all about the world and the people. I think they cannot be seen separately: circular, environmental, and social.”
(SU4)

Despite the different objectives, all the investigated start-ups stressed the importance of thinking long-term as a responsible society, also to ensure that their current activities do not harm future generations:

“Our vision is a responsible society for healthy oceans [...] the long-term impact is to raise awareness and create a more responsible society [...] Sustainability means that the way we do things shouldn't affect the next generation that comes after us. [...] what we do can last in time because it doesn't affect the environment”.
(SU5)

Not only long-term but also systemic thinking is prevalent as a sustainability orientation:

“Sustainability focuses on how we can create systems that are repeatable without a finite life”.
(SU5)

This means taking responsibility, reducing negative impacts as much as possible, considering externalities, and increasing positive social and environmental impacts. All the start-ups stressed that the business model must ensure sufficient value capture to guarantee the long-term survival of the company. Even though some of them ranked economic dimensions as the least relevant among the sustainability dimensions, they all aim to run a break-even business model and make profits:

“We need to be profitable to support our social and ecological goals.”
(SU6)

Overall, the targets for sustainability are in line with the current impact for all the start-ups investigated, which indicates that no major mission drift has occurred in the sample. However, start-ups need to adapt their business models to the market, the customers, and other influencing factors (see Section 4.4). Focusing on the relevance of sustainability in the business model, SU11 and SU15 considered the three dimensions of sustainability to be equally important, and that they have an equal impact on the economic, social, and environmental dimensions. The founder of SU15 spoke of the intertwined sustainability dimensions:

“The three dimensions are so important to each other that they cannot be ranked in a list because they are different sides of the same coin. So, if you take an environmental action, it will have economic consequences or social consequences. Same with social and economic.”
(SU15)

In contrast, although SU12, SU17, and SU19, consider the three dimensions equally important, they generate different degrees of impact, with SU12 and SU17 generating more value for the natural environment, and SU19 generating environmental and social value equally, and more than the financial side. The case of SU19 can be explained by the high environmental and social outcomes of their operations, but less success on the financial side, which might explain why this is one of their self-declared areas for improvement. Many respondents highlighted the difficulties in ranking the relevance of the three dimensions. An interesting hurdle arose in ranking the relevance of the economic dimension: circular-social hybrid start-ups are focused on creating environmental and social value, even though they need to survive in the current linear economic system, where making money and maximising profits are most important. As the founder of SU7 pointed out:

“People and planet have to go along with profits, otherwise we are not talking about a sustainability business”.
(SU7)

Overall, start-ups generate profits to finance the other two dimensions, thereby increasing their social and environmental impact. Conversely, pursuing social and environmental dimensions can contribute to a positive economic outcome, by providing a competitive advantage:

“From a sustainability point of view, it's not a challenge because it brings us positive competitive value.”

(SU13)

Drawing on the insights of the chairperson of SU11, if all three dimensions are considered from the outset, there are no priorities, and it is just a matter of long-term planning:

“Well-planned socially and environmentally sustainable strategies always mean economic advantage in the long run. Therefore, when developing environmental and climate strategies, it is important to take the social idea into account in any restructuring process and to think in economically long-term time frames and plan well in advance.”

(SU11)

The strong link between the different dimensions can also be appreciated by focusing on the perceived impact. None of the investigated start-ups considered the three dimensions separately but rather interpreted them as intertwined, with blurred boundaries (Mies and Gold, 2021). In the words of the founder of SU18:

“Environmental factors, and financial factors, they all affect people; people affect them and vice versa.”

(SU18)

In fact, according to SU6's chairperson, it should be in people's self-interest to protect biodiversity, the environment, and the climate for social reasons such as the survival of humanity with a high level of well-being:

“Ultimately, as humans, we do or should do it out of self-interest to live on a planet where we can still live without wars, without increasing inequalities. [...] So, the social thing is embedded in a bigger environmental thing, that we should also protect our climate and our biodiversity for social reasons.”

(SU6)

In some cases, such as SU12 and SU15, respondents were unable to rank the three dimensions in terms of impact due to their strong interrelationship:

“If you implement an environmental action, it will have economic consequences or social consequences. Same with the social and economic.”

(SU15)

“The environment imposes limits on resource consumption and emission pollution: people must find a way to maximise their welfare within these limits. One way is through innovations that make it possible to stay within the limits of the planet. [This translates] into actions that generate profit because, without profit, the impact cannot be financed.”

(SU12)

Entrepreneurial orientations in terms of sustainability dimensions may change at different stages, as shown for SU14 and SU19. When starting a business, the feasibility of the business plan is assessed in terms of the market, meeting customer needs and achieving social and environmental goals. Consequently, the economic dimension is prioritised as economic capacity is needed to scale up and attract new customers. Once break-even is reached, the social and environmental dimensions are prioritised. Looking at the overall picture, 15 start-ups considered their environmental impact to be the most important, with only four start-ups ranking social impact as first. Notably, 15 start-ups rated their economic impact as the least important:

“When we grow, create more business, in the meanwhile, we create more impact.”

(SU15)

The results stress the fact that although the adoption of CBMs is mainly linked to environmental impacts, social impacts can also be achieved.

Most of the start-ups investigated measure their sustainability impact internally. Some start-ups conduct a life cycle assessment, others are certified B Corps or in the process of becoming certified:

“We had the life cycle assessment done by [an external company] before we went to market because it was very important for us to know that we were truly sustainable, not just thinking we were.”

(SU14)

“Within the impact report, you will see that there is a measurement against our mission and goals, and then a measurement against a standard, which is the B Corp impact assessment.”

(SU15)

Start-ups that do not currently measure their impact, assured that it is on the agenda, with the main barriers being a lack of resources (staff and money) or limited internal expertise:

“We are planning for next year to have our yearly reports where we put in all the social hours. We want to show all the information, but we were very busy with our B Corp certification. It's the case of timing, we are too short.”

(SU4)

Following Fichter et al. (2023), assessing sustainability performance at the micro level of individual companies and their business models is necessary to identify challenges and trade-offs in decision-making and thus avoid mission drift. For the sampled start-ups, challenges emerged that could potentially lead them to deviate from the sustainability path. The sampled start-ups were founded with a specific sustainability orientation, but during the establishment of processes, structures and a business model, the sustainability focus changed for most of them. Table 3 shows the details of the aspects mentioned above, namely sustainability targets, impact, and measurement.

4.3. Measuring sustainability impact

Among the economic indicators that emerged as relevant are local production; resource consumption; lean and agile production; remanufacturing and reuse; recycling and upcycling; and improved process technology. The latter is not surprising, as start-ups invest almost everything in research and development activities, to develop and test products, services, and business models (Bocken et al., 2018).

In terms of the social dimension, most of the start-ups invest in community projects either with their operational resources, such as SU2, or together with their partners, such as SU1. As described by the sustainability manager of SU2:

“The very last step of this [business] cycle is the reinvestment. So, at the end of the year, we get the profit from the whole [business] cycle, a fixed three per cent of that goes back to Tanzania where we reinvest in social impact projects.”

(SU2)

Some start-ups work closely with local social cooperatives employing disadvantaged people, people with disabilities, or migrants for activities related to sourcing, production, packaging, and logistics, as in SU1, SU4, SU13, SU16, SU17. Focusing for example on SU13:

“We outsource to social cooperatives all the picking and preparation of the packaging of all the orders. So basically, we have our warehouse on their premises.”

(SU13)

These initiatives not only provide jobs for minorities but also train them for higher-skilled jobs and give them a sense of social security. In some cases, start-ups hired only people previously unemployed (SU9), women in need (SU2), or people in developing countries (SU5, SU19). In addition, all start-ups are concerned with raising awareness toward the social or environmental issues they address and try to communicate as

Table 3
Sustainability targets, impact, and measurement.

Start-up ID	Purpose	Dimensions targeted			Dimensions impacted			Sustainability measurement	
		Eco	Env	Soc	Eco	Env	Soc	Internal	External
SU1	Circular	•	••	•••	•	•••	••	✓	✓
SU3	Circular	•	•••	••	•	•••	••	✓	✓
SU12	Circular	•••	•••	•••	•	•••	••	✓	
SU17	Circular	•••	•••	•••	•	•••	••	✓	
SU20	Circular	•••	•••	••	•••	•••	••	✓	✓
SU8	Circular & social	•	•••	••	•	•••	••	✓	
SU9	Circular & social	•	•••	••	•	•••	••	✓	✓
SU11	Circular & social	••	•••	••	•••	•••	•••	✓	
SU2	Social	•	••	•••	•	••	•••	✓	
SU5	Social	•••	•	••	•	••	•••	✓	
SU6	Social	•	••	•••	•	••	•••	✓	
SU7	Social	•	••	•••	•	•••	••	✓	
SU15	Social	•••	•••	•••	•••	•••	•••	✓	✓
SU19	Social & environmental	•••	•••	•••	•	•••	•••	✓	
SU16	Circular & sustainable	•	•••	••	•	•••	••		
SU4	Sustainable	••	•••	•••	•	•••	••	✓	✓
SU13	Sustainable	•••	••	••	•••	••	••	✓	
SU14	Sustainable	••	•••	•	••	•••	•	✓	
SU18	Sustainable	•	•••	•••	•	•••	••	✓	✓
SU10	Purpose*	•	•••	••	•	•••	••	✓	✓

Legend: relevance of the dimension according to the respondents. • Low; •• Medium; ••• High.

* SU10 defined itself as a purpose start-up. Quotes from respondents regarding sustainability perceptions are reported in supplementary information S2, Table S2, and supplementary information S3, Fig. S3.

transparently as possible with customers, other stakeholders, and society at large.

In terms of the environmental dimension, start-ups were interested in evaluating aspects related to the natural environment, such as biodiversity, and environmental management, including environmental budgets, certifications, and emissions tracking. As the founder of SU9 explains:

“We have this B Corp certification, which is important. So, the B Corp certification is renewed every three years, and you can track your improvement, thanks to the score you get at the end of the certification.”
(SU9)

Most of the start-ups use recycled materials in production and all design their products to minimise waste and emissions and to be easily recyclable. Many of the start-ups themselves recycle or upcycle waste streams that they reuse in their production, as SU1 and SU17.

In the absence of sustainability performance indicators for start-ups (Kristensen and Mosgaard, 2020), we adopted Cagno et al. (2019)’s model as a reference base, but it was developed for industrial companies. The evidence collected underlined that an accurate measurement scheme is necessary for assessing the sustainability impact even though difficulties might be encountered in its implementation (Trautwein, 2021). For example, SU10 and SU14 perform a life cycle assessment with an external company to report on the environmental aspects of the products, but it is difficult to do the same for social indicators because it involves an assessment of the whole company, which is very labour- and data-intensive. In addition, social aspects are harder to measure because of a lack of figures:

“It is very difficult, because social metrics are mostly qualitative, but everyone wants quantitative metrics. And you do not have too much space to explain it.”
(SU10)

However, start-ups are also adapting to this situation by developing their own transparency models (SU4) or software solutions to become fully transparent to their customers (SU9):

“Our customers need to be involved in our approach in some way. We incorporate digital solutions into our products so that customers can see

how the fabric is made, who made it and where it was made. There is a lot of information at customers’ disposal”.
(SU9)

From this point of view, the model of Cagno et al. (2019) has been enriched with additional performance indicators based on the evidence collected, to better fit the context studied. We consider the proposed list of indicators as a useful starting point for the sustainability assessment of start-ups. Table 4 shows the performance indicators used by the analysed start-ups to measure their sustainability impact.

4.4. Areas of improvement

The most urgent areas of improvement relate to the economic dimension:

“What’s on my agenda now is to grow, that’s for sure, to increase turnover and to get customers.”
(SU14)

This is due to the processes of scaling up, growing, and acquiring new customers or members, depending on the individual business model:

“The economics behind that are probably going to be quite difficult. So, we need to look at that in more detail and how can we incentivise our customers to return the mattresses, especially considering the restrictions of waste legislation.”
(SU20)

The development of digital solutions and technologies for products is also a priority. For example, SU5 is working on the sophistication of its boats:

“In terms of technology, we are looking at electrifying our boats. We’re looking at optimising the boats, which means building a new version of the boat to get more impact with less financial input [...] Scalable processes and digital expansion are the core issues for the near future.”
(SU5)

Overall, start-ups seemed to focus more on increasing revenues than on reducing costs. Start-ups are trying to find solutions to attract customers and increase revenues, while at the same time having sufficient liquidity to invest in product development and related activities, such as

Table 4
Sustainability indicators being used by circular-social hybrid start-ups.

Performance area	Performance category	Indicators for start-ups	Start-up ID	
Economic	Investments	Research and development investments	All	
		Fixed direct investment from profits to social projects/ partnerships*	2, 12	
	Production	Product quality	1, 13	
		Consumption of resources*	1, 3, 4, 7, 8, 9, 10, 11, 12, 13, 16, 17	
		Local production*	1, 4, 7, 9, 13, 15, 16, 20	
		Lean & agile production*	1	
		Remanufacturing & reuse*	1, 3, 4, 11, 12, 14	
		Recycling & upcycling*	1, 3, 4, 7, 8, 9, 10, 13, 16, 17, 20	
		Process technology*	1, 3, 5, 8, 12, 17, 19	
		Suppliers	Local suppliers	6, 7, 11, 12, 15, 16
			Take-back system* or secondary materials use*	All manufacturing or retailing start-ups
		Globalisation* Market*	International issues*	2, 5, 10, 14, 17, 19
	Market opportunity*		5, 12, 14, 17, 18, 20	
	Social	Community	Community projects	1, 2, 3, 4, 5, 6, 9, 10, 11, 13, 15, 16, 17, 18, 19
Involvement in local community			1, 2, 4, 5, 7, 9, 15, 19	
Social security for partners*			2, 5, 9, 10, 11, 15, 16, 17, 18, 19	
Social dialogue with partners*			1, 2, 5, 6, 7, 18, 19	
Education*			2, 3, 4, 6, 9, 15, 16, 18, 19	
Human rights protection*			2	
Employees		Employment for disadvantaged groups*	1, 2, 4, 5, 9, 10, 11, 13, 16, 19	
		Work conditions*	1, 2, 4, 5, 11, 14, 19	
		Organizing flexible work*	2, 4, 5, 19	
		Gender percentage in staff*	2, 9	
Customers		Marketing & information*	1, 2, 3, 4, 5, 7, 9, 10, 18	
		Awareness raising*	All	
		Feedback & co-creation*	1	
Environmental		Occupational Health and Safety	Absenteeism	10
	Water	Quality of water	5, 19	
		Recycled material use	All manufacturing start-ups	
	Energy	Renewable energy use	2, 3, 17	
		CO2 saved	5, 10, 13, 19, 20	
	Air emissions	Waste recycled	1, 3, 4, 5, 7, 8, 9, 10, 13, 14, 16, 17, 20	
		Waste reduced *	All	
	Waste	Environmental budget, certifications & emissions tracking*	1, 3, 4, 9, 10, 14, 19, 20	
		Environmental management	1, 3, 4, 9, 10, 14, 19, 20	
	Natural environment*	Ecosystem service*	5, 15, 19, 20	
Protection of biodiversity*		5, 6, 19		

The categorisation is based on Cagno et al. (2019); new indicators and categories that emerged from the empirical analysis are marked with an asterisk (*).

product innovation, improving the customer journey by offering additional services, and developing a take-back system. In the words of the founder of SU1:

“What we need to do is to increase the collection services to extend the fibres, and that’s where we have more market”.
(SU1)

Improvements in the social dimension focus on working conditions, both internally and at the project partner’s facilities, especially for start-ups operating in developing countries. Occupational safety is also an issue:

“In Germany, people wear safety shoes in certain situations. If you try to get people in Cambodia to wear safety shoes, they will laugh at you, because it is 45 degrees. There are several aspects we want to improve, but we always must look at them from the culture of the regions we are working in.”
(SU5)

There is also a focus on increasing salaries, professionalising human resource management, and offering more long-term contracts:

“If we could, we would pay our people better because they put so much effort into what we do. They deserve more. I think we all do.”
(SU5)

Externally, the network of social cooperatives aims to improve the level of training and cooperation with stakeholders, including more communication with external parties outside the enterprise.

In terms of the environmental dimension, tracking materials and products are the most urgent aspects, together with measuring the company’s carbon footprint. The latter could also bring economic benefits, as carbon dioxide (CO₂) certificates could be sold, providing a new source of revenue. Other priorities are related to making production processes, products, and packaging more environmentally friendly and circular (Chiaroni and Urbinati, 2016), as well as local sourcing and production, green logistics, extending the life of products, and setting up a take-back system and repair service. The founder of SU14 summarised improvements in the environmental dimension as follows:

“We would further optimise the products if we find that there are updated ways to move the products better through the logistics process or make them more durable, but also use more recycled material, find further or new recycling possibilities, improve our supply chain so that we emit less”.
(SU14)

Table 5 shows the areas of improvement as reported by the respondents.

4.5. Leverage points to increase sustainability impact

The previous discussion showed that the sustainability targets of start-ups can change over time (Trautwein, 2021). For example, SU1, recognised opportunities in the area of sustainable textiles. They started their activities with a circular mission to avoid waste in the textile sector, but the social dimension became more relevant over time, to the point that it is now considered the most relevant one. They address this by employing migrants in circular textile production in social projects and by proactively communicating with society about the possibilities of recycling and upcycling their old clothes.

Business models can also change over time (Bocken et al., 2018). The activities carried out in business value creation, delivery and capture create a positive or negative impact on sustainability in the different dimensions. In this scenario, it is important to maximise the net benefit for a positive sustainability impact (Horne and Fichter, 2022). Once the sustainability impact has been assessed, areas for improvement in the business model can be identified to achieve the original targets. If the original targets cannot be realistically achieved and deviations are

Table 5
Areas of improvement to increase sustainability as reported by the sample start-ups.

Dimension	Improvement area	Start-up ID	
Economic	Scale-up, growth, new customer, or members	4, 5, 6, 9, 10, 11, 13, 14, 15, 16, 19	
	Development of IT solution	11, 12, 14, 18	
	Expansion of markets	13, 18	
	Product innovation	13	
	Increase long-time planning	11	
	Improve offering/ value proposition	15	
	Improve value capture: create carbon credit certificates for every product	15	
	Reduce products' price, maintaining quality and sustainability standards	4	
	Improve customer journey	18	
	Adapt business model to take-back system and recycling	20	
	Social	Improve working conditions on-site and among partners located in emerging countries	2, 5, 10, 19
		Increase salaries of employees and managers	3, 5, 12
		Improve HR management	12
		Creating more permanent employment contracts	11
Widen network of social cooperatives		13	
More educational offers like workshops		6	
Establish knowledge management in organization		6	
Bringing all stakeholders together		11	
More external communication		18	
Environmental		Improve materials tracking along the supply chain for product certification	8, 12, 15, 16, 18
	Collection and take-back systems	1, 14, 20	
	Research for better recycling	11, 14, 20	
	Sustainability consultation for partners, suppliers, and producers	6, 15	
	More sustainable packaging	7, 12	
	Testing more sustainable production processes	9, 14	
	More local sourcing and production	10, 17	
	Green logistics also for international distances	13, 18	
	Increase product lifetime & reuse opportunities	10, 14	
	Make the use of recycled material mainstream in production	3	
Establish repair service	12		

necessary, business models need to be adapted in their value proposition, creation, delivery, or capture (Kolpinski et al., 2022) to create a net sustainable benefit. For example, SU12 modified parts of its business model over time to better target the buyers and sellers on its platform, optimise its offering to both groups and capture value more efficiently. After running the business model for a few months, SU12 learned what kind of materials were being collected from households and what it would cost them to organise pick-ups, sort these items and sell them on their platform to different buyers, such as second-hand shops, upcycling labels or private consumers so that they could better calculate their finances. They have introduced a collection fee and a minimum fee for selling products on their platform:

“We split the sales of each item in half, but we make a minimum of €10 per sale. If you give us a T-shirt that's in very good condition and we upload it, but it's a low-value item, we upload it for €12. You get €2 and we keep €10.”

(SU12)

Business model adaptation is particularly important in the scale-up phase of start-ups (Hockerts and Wüstenhagen, 2010). Many start-ups reported that scaling up was their most urgent area for improvement, to attract new customers and increase revenues (e.g., SU4, SU5, SU6, SU9, SU10, SU11, SU13, SU14, SU15, SU16, SU19). From this point of

view, either costs should decrease, which is often not feasible for start-ups due to high initial investments, or revenues should increase. Nevertheless, CBMs face higher costs than traditional linear business models (Kolpinski et al., 2022; Linder and Williander, 2017), and economic constraints are perceived as relevant barriers. As the founder of SU14 commented:

“Sustainability almost always costs more than unsustainable products”.
(SU14)

Fig. 3 illustrates the identified leverage points in the business models of circular-social hybrid start-ups.

The leverage points emerged from the research based on the business models' dynamics and represent success factors for the continuous embedding of sustainability in the business models of any new venture aiming at sustainability outcomes. The leverage points are subject to constant cycling and adaptation as start-ups face many uncertainties and unforeseen changes in their external environment and need to constantly reconfigure their business models to adapt to the new situation (Trautwein, 2021). We understand leverage points as priority points for interventions in a system to transform it (Chan et al., 2020; Meadows, 1999).

The first leverage point is economic and related to scaling up and growth of the start-up. “Scale-up and growth” is necessary to reach a financial break-even point to ensure the long-term survival of the start-up and its sustainable impact. Markets should be expanded, and the company's value proposition should be continuously improved to better serve the customer, for example by improving the customer journey and enabling better value capture. The founder of SU13 explained:

“We want to improve the amount of food waste we save because in the cosmetics sector we use a very low percentage of food waste as raw material. For example, for a serum of 15 millilitres the highest percentage of raw material used is around 5% to 6%. 5% of 50 milligrams of a face cream is nothing. That is why we want to increase the number of markets in which we work to have a higher consumption of raw materials from food waste.”

(SU13)

The second leverage point is linked to the development of well-functioning information technologies. “Digital solutions” are crucial for the establishment of circular processes such as collection and repair services, take-back and recycling systems (Neri et al., 2023). The case of

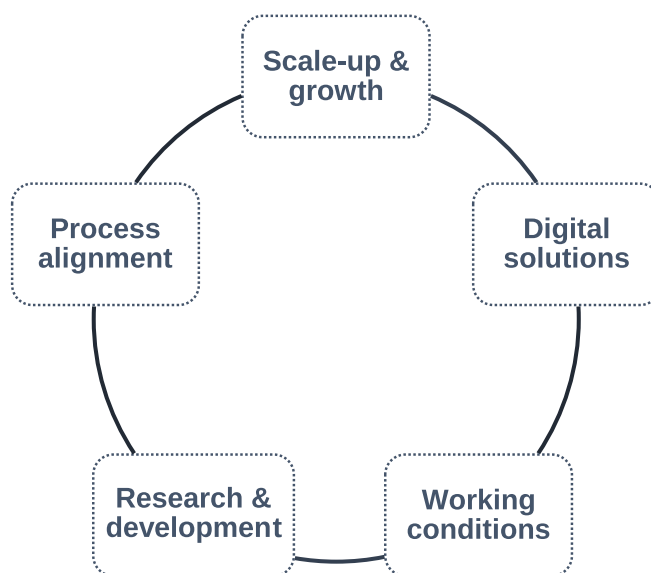


Fig. 3. Business model leverage points for start-ups with an entrepreneurial sustainability orientation.

SU14 illustrates this:

“The issue of information technologies extension is very strong. We have the proof of concept with a plug-in, but we need more plug-ins for different web shop systems and the extension of the digital solution in general.”

(SU14)

The aim of establishing these processes and services is to increase reuse opportunities and extend the life of products for a more environmentally friendly use of resources. As the founder of SU20 said:

“Establishing the whole take-back process for us requires a lot more validation. Now it's possible, but the economics behind it are probably going to be quite difficult. [...] so our impact is very much on the mattress waste, that's the impact on the planet.”

(SU2)

The third leverage point relates to the social dimension, fair working conditions for employees and responsibility for working conditions in partner companies. “Working conditions” is not only about offering competitive salaries to employees and managers but also establishing appropriate human resource management systems, including more permanent contracts and training for employees:

“We always pay people more than the average salary, but there is always room for improvement because we want to invest as much as possible in people.”

(SU5)

For SU10, it is also about improving the working conditions at the project sites:

“Working conditions can always be improved, for example, by providing a sorting belt in the factories, better vehicles for transport, and so on.”

(SU10)

In addition, better knowledge management systems could facilitate internal processes. With better working conditions, start-ups can recruit and retain committed, mission-driven, and well-trained staff, giving them a competitive advantage. The founder of SU19 explained as follows:

“We have realised that it can only work with people, and we work very closely with local people. That is also our success story, we have so much local impact and social impact, which we then use to help the planet.”

(SU19)

The fourth leverage point is research and development. “Research and development” is important for product innovation, improving long-term planning, increasing recycling opportunities and providing in-depth sustainability advice to partners, suppliers and manufacturers. SU13 is currently in the research and development phase to patent its research and development efforts:

“We are transforming the food waste with an upcycling process that we are patenting. We get a kind of paste out of it, which we only use in the cosmetics industry for now, but we are doing some studies to develop the first nutraceutical product.”

(SU13)

The fifth leverage point calls for the alignment of processes to minimise emissions by bringing all stakeholders in the value chain on board. Examples of “Process alignment” include more sustainable packaging, focusing on local sourcing and production to minimise logistics, green logistics, and testing more sustainable production processes:

“We're working with our supply chain partners and other organisations to make it happen. It is going to be a long journey because it's much more complex on a larger scale.”

(SU3)

In terms of improving internal processes, the founder of SU18

explains:

“I would like to get better at customer journeys, logistics and just more efficiency. I think we lack efficiency now, which is just a realistic and logical thing, but very important.”

(SU18)

4.6. Limitations and suggestions to further work

The overall aim of the present work was to identify how circular-social hybrid start-ups follow their path toward sustainability. Despite the contribution made, the work is not free from caveats, which nevertheless pave the way for future research.

The start-ups investigated are only European start-ups from Central and Southern Europe and Scandinavia. The results may therefore be different in other contexts, and future research is encouraged to explore the differences and specificities of each context of analysis. The semi-structured interviews were conducted with only one respondent per start-up (mainly the founder) so that only one perspective was captured. Future research should also include different stakeholders as well to get a broader picture of the value created for the different target groups and to identify unintended effects that may occur for others who are not targeted. The results show that the boundaries between sustainability dimensions in circular-social hybrid start-ups are blurred and that the dimensions are intertwined, connected and interdependent (Merli et al., 2018; Mies and Gold, 2021). From this perspective, further research is needed. First, it is important to be aware of intended and unintended effects (Fichter et al., 2023), especially when assessing macro-level impacts on broader socio-technical systems, markets, and the natural environment. Second, further empirical research should address the social dimension of the circular economy and the assessment of its impacts (Valencia et al., 2023). The results also showed that not all start-ups follow their initial sustainability targets, as there are some barriers. Future studies should investigate these barriers, as well as the drivers to overcome them and find solutions to align sustainability targets with actual impact. Furthermore, future research is invited to apply, validate, and adapt the leverage points presented with different business models or sustainability focuses, and with different company sizes or later-stage start-ups.

5. Conclusions

The study examined how circular-social hybrid start-ups achieve sustainability by exploring business model dynamics and leverage points to prevent mission drift. The findings indicate that there were no significant mission drifts, but constant adjustments to the business models were required. The identified leverage points indicate potential areas where the mission may deviate, highlighting business model-related risks that are critical for start-ups to achieve their sustainability goals. These findings are relevant to practitioners, including entrepreneurs and consultants, as well as academics studying sustainability transitions.

The present work makes several contributions. For academic purposes, this work offers empirical insights into the entrepreneurial orientation of sustainability-focused start-ups. It also contributes to the conversation on impact assessment by applying existing conceptual frameworks to be tested in an empirical setting. Furthermore, it provides a first categorisation of sustainability performance indicators that can be applied by all start-ups interested in improving their sustainability performance. These indicators can be useful for practitioners and academics alike. The same applies to the sustainability assessment scheme, which can be used to analyse the sustainability impact of start-ups and reflect on their sustainability path. The leverage points reveal some business model dynamics and show entrepreneurs which factors to pay attention to when starting a sustainability-oriented business to avoid mission drift. To ensure transparency and authenticity, it is recommended to clearly communicate activities, performance, values, and

impact to all stakeholders who may be affected by the business model, whether intentionally or unintentionally.

CRedit authorship contribution statement

Charleen von Kolpinski: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Validation, Visualization, Writing – original draft, Writing – review & editing. **Enrico Cagno:** Conceptualization, Validation, Writing – review & editing. **Alessandra Neri:** Conceptualization, Investigation, Methodology, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of competing interest

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

Acknowledgements

We acknowledge support by Technische Universität Berlin for providing the doctoral exchange scholarship.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.spc.2024.03.036>.

References

- Andersén, J., Ljungkvist, T., Svensson, L., 2015. Entrepreneurially oriented in what? A business model approach to entrepreneurship. *J. Small Bus. Enterpr. Dev.* 22 (3), 433–449. <https://doi.org/10.1108/JSBED-11-2013-0170>.
- Antikainen, M., Valkokari, K., 2016. A framework for sustainable circular business model innovation. *Technol. Innov. Manag. Rev.* 6 (7), 5–12. <https://doi.org/10.22215/timreview/1000>.
- Battilana, J., Dorado, S., 2010. Building sustainable hybrid organizations: the case of commercial microfinance organizations. *Acad. Manag. J.* 53 (6), 1419–1440. <https://doi.org/10.5465/amj.2010.57318391>.
- Böckel, A., Farny, S., Bocken, N., 2023. The power of words: formation of partnerships through circular startups. *Acad. Manag. Proc.* 2023 (1), 18153. <https://doi.org/10.5465/AMPROC.2023.18153abstract>.
- Bocken, N.M.P., 2015. Sustainable venture capital – catalyst for sustainable start-up success? *J. Clean. Prod.* 108, 647–658. <https://doi.org/10.1016/j.jclepro.2015.05.079>.
- Bocken, N.M.P., Schuit, C.S.C., Kraaijenhagen, C., 2018. Experimenting with a circular business model: lessons from eight cases. *Environ. Innov. Soc. Trans.* 28, 79–95. <https://doi.org/10.1016/j.eist.2018.02.001>.
- Cagarman, K., Fajga, K., Kratzer, J., 2023. Capturing the sustainable impact of early-stage business models: introducing esSROI. *Highlights of Sustainability* 2 (3), 171–184. <https://doi.org/10.54175/hsustain2030013>.
- Cagno, E., Neri, A., Howard, M., Brenna, G., Trianni, A., 2019. Industrial sustainability performance measurement systems: A novel framework. *J. Clean. Prod.* 230, 1354–1375. <https://doi.org/10.1016/j.jclepro.2019.05.021>.
- Cagno, E., Negri, M., Neri, A., Giambone, M., 2023. One framework to rule them all: an integrated, multi-level and scalable performance measurement framework of sustainability, circular economy and industrial symbiosis. *Sustainable Production and Consumption* 35, 55–71. <https://doi.org/10.1016/j.spc.2022.10.016>.
- Centobelli, P., Cerchione, R., Chiaroni, D., Del Vecchio, P., Urbinati, A., 2020. Designing business models in circular economy: a systematic literature review and research agenda. *Bus. Strateg. Environ.* 29 (4), 1734–1749. <https://doi.org/10.1002/bse.2466>.
- Chan, K.M.A., Boyd, D.R., Gould, R.K., et al., 2020. Levers and leverage points for pathways to sustainability. *People and Nature* 2, 693–717. <https://doi.org/10.1002/pan3.10124>.
- Chiaroni, D., Urbinati, A., 2016. Circular Economy Business Models: Towards a New Taxonomy of the Degree of Circularity, pp. 1–27. <https://ar1.liuc.it/esploro/outputs/conferencePaper/Circular-economy-business-models-towards-a/991000853830405126#file-0>.
- Ciccillo, F., Pero, M., Patrucco, A.S., 2023. Designing circular supply chains in start-up companies: evidence from Italian fashion and construction start-ups. *The International Journal of Logistics Management* 34 (3), 553–581. <https://doi.org/10.1108/IJLM-04-2022-0158>.
- Corbin, J., Strauss, A., 1990. Grounded theory research: procedures, canons and evaluative criteria. *Z. Soziol.* 19 (6), 418–427. <https://doi.org/10.1515/zfsoz-1990-0602>.
- Cullen, U., De Angelis, R., 2021. Circular entrepreneurship: a business model perspective. *Resour. Conserv. Recycl.* 168, 1–32. <https://doi.org/10.1016/j.resconrec.2020.105300>.
- Dees, J.G., 2012. A tale of two cultures: charity, problem solving, and the future of social entrepreneurship. *J. Bus. Ethics* 111 (3), 321–334. <https://doi.org/10.1007/s10551-012-1412-5>.
- Defourny, J., 2001. From Third Sector to Social Enterprise. Routledge, London and New York. <https://www.taylorfrancis.com/chapters/edit/10.4324/9780203487747-10/third-sector-social-enterprise-european-research-trajectory-jacques-defourny>.
- Dembek, K., Lüdeke-Freund, F., Rosati, F., Froese, T., 2023. Untangling business model outcomes, impacts and value. *Bus. Strateg. Environ.* 32 (4), 2296–2311. <https://doi.org/10.1002/bse.3249>.
- Eisenhardt, K.M., 1989. Theories from case study research. *Acad. Manag. Rev.* 14 (4), 532–550. <https://doi.org/10.2307/258557>.
- Eisenhardt, K.M., 2021. What is the Eisenhardt method, really? *Strateg. Organ.* 19 (1), 147–160. <https://doi.org/10.1177/1476127020982866>.
- Eisenhardt, K.M., Graebner, M.E., 2007. Theory building from cases: opportunities and challenges. *Acad. Manag. J.* 50 (1), 25–32. [https://doi.org/10.1002/1097-0266\(200701/11\)21:1%3C31:105::AID-SMJ133%3E3.0.CO;2-E](https://doi.org/10.1002/1097-0266(200701/11)21:1%3C31:105::AID-SMJ133%3E3.0.CO;2-E).
- Elkington, J., 1994. Enter the Triple Bottom Line. Chapter 1 (Ed. 17/8/04). <https://johnelkington.com/archive/TBL-elkington-chapter.pdf>.
- Evans, S., Vladimirova, D., Holgado, M., van Fossen, K., Yang, M., Silva, E.A., Barlow, C. Y., 2017. Business model innovation for sustainability: towards a unified perspective for creation of sustainable business models. *Bus. Strateg. Environ.* 26 (5), 597–608. <https://doi.org/10.1002/bse.1939>.
- Ferasso, M., Beliaeva, T., Kraus, S., Clauss, T., Ribeiro-Soriano, D., 2020. Circular economy business models: the state of research and avenues ahead. *Bus. Strateg. Environ.* 29, 3006–3024. <https://doi.org/10.1002/bse.2554>.
- Fichter, K., Lüdeke-Freund, F., Schaltegger, S., Schillebeeckx, S.J.D., 2023. Sustainability impact assessment of new ventures: an emerging field of research. *J. Clean. Prod.* 384, 135452. <https://doi.org/10.1016/j.jclepro.2022.135452>.
- Filion, L.J., 2011. Defining the entrepreneur. In: Dana, L.-P. (Ed.), *World Encyclopedia of Entrepreneurship*. Edward Elgar, Cheltenham, UK and Northampton, MA, USA, pp. 41–52.
- Fisher, J., Riechers, M., 2019. A leverage points perspective on sustainability. *People Nat.* 1, 115–120. <https://doi.org/10.1002/pan3.13>.
- Frishammer, J., Parida, V., 2019. Circular business model transformation: a roadmap for incumbent firms. *Calif. Manag. Rev.* 61 (2), 5–29. <https://doi.org/10.1177/0008125618811926>.
- Gauthier, C., Shanahan, G., Daudigeos, T., Ranville, A., Dey, P., 2020. Tackling economic exclusion through social business models: a typology. *Int. Rev. Appl. Econ.* 34 (5), 588–606. <https://doi.org/10.1080/02692171.2019.1707785>.
- Geissdoerfer, M., Savaget, P., Bocken, N.M.P., Hultink, E.J., 2017. The circular economy – a new sustainability paradigm? *J. Clean. Prod.* 143, 757–768. <https://doi.org/10.1016/j.jclepro.2020.123741>.
- Geissdoerfer, M., Pieroni, M.P.P., Pigosso, D.C.A., Soufani, K., 2020. Circular business models: a review. *J. Clean. Prod.* 277, 1–17. <https://doi.org/10.1016/j.jclepro.2020.123741>.
- George, G., Bock, A.J., 2011. The business model in practice and its implications for entrepreneurship research. *Entrep. Theory Pract.* 35 (1), 83–111. <https://doi.org/10.2139/ssrn.1490251>.
- Gibbert, M., Ruigrok, W., Wicki, B., 2008. Research notes and commentaries. What passes as a rigorous case study? *Strateg. Manag. J.* 29, 1465–1474. <https://doi.org/10.1002/smj.722>.
- Gupta, P., Chauhan, S., Paul, J., Jaiswal, M.P., 2020. Social entrepreneurship research: a review and future research agenda. *J. Bus. Res.* 113, 209–229. <https://doi.org/10.1016/j.jbusres.2020.03.032>.
- Hall, J.K., Daneke, G.A., Lenox, M.J., 2010. Sustainable development and entrepreneurship: past contributions and future directions. *J. Bus. Ventur.* 25 (5), 439–448. <https://doi.org/10.1016/j.jbusvent.2010.01.002>.
- Han, D., Konietzko, J., Dijk, M., Bocken, N., 2023. How do circular start-ups achieve scale? *Sustainable Production and Consumption* 40, 363–375. <https://doi.org/10.1016/j.spc.2023.06.007>.
- Henry, M., Bauwens, T., Hekkert, M., Kirchherr, J., 2020. A typology of circular start-ups: an analysis of 128 circular business models. *J. Clean. Prod.* 245, 1–52. <https://doi.org/10.1016/j.jclepro.2019.118528>.
- Hockerts, K., Wüstenhagen, R., 2010. Greening Goliaths versus emerging Davids — theorizing about the role of incumbents and new entrants in sustainable entrepreneurship. *J. Bus. Ventur.* 25 (5), 481–492. <https://doi.org/10.1016/j.jbusvent.2009.07.005>.
- Hofmann, F., Jaeger-Erben, M., 2020. Organizational transition management of circular business model innovations. *Bus. Strateg. Environ.* 29 (6), 2770–2788. <https://doi.org/10.1002/bse.2542>.
- Homrich, A.S., Galvão, G., Abadia, L.G., Carvalho, M.M., 2018. The circular economy umbrella: trends and gaps on integrating pathways. *J. Clean. Prod.* 175, 525–543. <https://doi.org/10.1016/j.jclepro.2017.11.064>.
- Horne, J., Fichter, K., 2022. Growing for sustainability: enablers for the growth of impact startups – a conceptual framework, taxonomy, and systematic literature review. *J. Clean. Prod.* 349, 131163. <https://doi.org/10.1016/j.jclepro.2022.131163>.
- Jaeger-Erben, M., Jensen, C., Hofmann, F., Zwiers, J., 2021. There is no sustainable circular economy without a circular society. *Resour. Conserv. Recycl.* 168. <https://doi.org/10.1016/j.resconrec.2021.105476>.
- Jin, B., 2019. The practical intelligence of social entrepreneurs: managing the hybridity of social enterprises. *Entrep. Res. J.* 1–19. <https://doi.org/10.1515/erj-2018-0007>.

- Johnson, M.P., Schaltegger, S., 2020. Entrepreneurship for sustainable development: a review and multilevel causal mechanism framework. *Entrep. Theory Pract.* 44 (6) <https://doi.org/10.1177/1042258719885368>.
- Kamaludin, M.F., 2023. Social sustainability within social entrepreneurship. *Technol. Forecast. Soc. Chang.* 192, 122541 <https://doi.org/10.1016/j.techfore.2023.122541>.
- Kolpinski, C., Yazan, D.M., Fraccascia, L., 2022. The impact of internal company dynamics on sustainable circular business development: insights from circular startups. *Bus. Strateg. Environ.* 1–20 <https://doi.org/10.1002/bse.3228>.
- Kolpinski, C., Bläute, A., Cagarman, K., 2023. Barriers to social impact measurement in the intersection of circular and social enterprises: a single case study from Germany. In: *New Business Models Conference Proceedings 2023*. Maastricht University Press. <https://doi.org/10.26481/mup.2302.29>.
- Kristensen, H.S., Mosgaard, M.A., 2020. A review of micro level indicators for a circular economy – moving away from the three dimensions of sustainability? *J. Clean. Prod.* 243 <https://doi.org/10.1016/j.jclepro.2019.118531>.
- Kuhlmann, M., Bening, C.R., Hoffmann, V.H., 2022. How incumbents realize disruptive circular innovation - overcoming the innovator's dilemma for a circular economy. *Bus. Strateg. Environ.* 1–16 <https://doi.org/10.1002/bse.3109>.
- Linder, M., Williander, M., 2017. Circular business model innovation: inherent uncertainties. *Bus. Strateg. Environ.* 26 (2), 182–196. <https://doi.org/10.1002/bse.1906>.
- Lüdeke-Freund, F., Gold, S., Bocken, N.M.P., 2019. A review and typology of circular economy business model patterns. *J. Ind. Ecol.* 23 (1), 36–61. <https://doi.org/10.1111/jiec.12763>.
- Lüdeke-Freund, F., Dembek, K., Rosati, F., Rauter, R., Schaltegger, S., Fichter, K., 2021. Assessing and managing sustainable business models – a status update. In: *Presented at the 6th International Conference on New Business Models*, 9–11 June 2021, Halmstad, Sweden (virtual).
- Mair, J., Marti, I.L., 2006. Social entrepreneurship décor: a source of explanation, prediction and delight. *J. World Bus.* 41, 36–44. <https://doi.org/10.1016/j.jwb.2005.09.002>.
- Meadows, D.H., 1999. *Leverage Points: Places to Intervene in a System*. The Sustainability Institute.
- Merli, R., Preziosi, M., Acampora, A., 2018. How do scholars approach the circular economy? A systematic literature review. *J. Clean. Prod.* 178, 703–722. <https://doi.org/10.1016/j.jclepro.2017.12.112>.
- Mies, A., Gold, S., 2021. Mapping the social dimension of the circular economy. *J. Clean. Prod.* 321 <https://doi.org/10.1016/j.jclepro.2021.128960>.
- Mills, A., 2010. *Encyclopedia of Case Study Research*. <https://doi.org/10.4135/9781412957397.n139>.
- Mora-Contreras, R., Ormazabal, M., Hernández-Salazar, G., Torres-Guevara, L.E., Mejía-Villa, A., Prieto-Sandoval, V., Carrillo-Hermosilla, J., 2023. Do environmental and cleaner production practices lead to circular and sustainability performance? Evidence from Colombian manufacturing firms. *Sustainable Production and Consumption* 40, 77–88. <https://doi.org/10.1016/j.spc.2023.06.004>.
- Neri, A., Cagno, E., Trianni, A., 2021. Barriers and drivers for the adoption of industrial sustainability measures in European SMEs: empirical evidence from chemical and metalworking sectors. *Sustainable Production and Consumption* 28, 1433–1464. <https://doi.org/10.1016/j.spc.2021.08.018>.
- Neri, A., Negri, M., Cagno, E., Kumar, V., Garza-Reyes, J.A., 2023. What digital-enabled dynamic capabilities support the circular economy? A multiple case study approach. *Bus. Strateg. Environ.* <https://doi.org/10.1002/bse.3409>.
- Nikolaou, I.E., Tsagarakis, N., 2021. An introduction to circular economy and sustainability: some existing lessons and future directions. *Sustainable Production and Consumption*. 28, 600–609.
- OECD, 2022. Policy brief on making the most of the social economy's contribution to the circular economy. In: *OECD Local Economic and Employment Development (LEED) Papers*, No. 2022/01. OECD Publishing, Paris. <https://doi.org/10.1787/e9eea313-en>.
- Padilla-Rivera, A., Russo-Garrido, S., Merveille, N., 2020. Addressing the social aspects of circular economy: a systematic literature review. *Sustainability* 12, 1–17. <https://doi.org/10.20944/preprints202009.0044.v1>.
- Palomares-Aguirre, I., Barnett, M., Layrisse, F., Husted, B.W., 2018. Built to scale? How sustainable business models can better serve the base of the pyramid. *J. Clean. Prod.* 172, 4506–4513. <https://doi.org/10.1016/j.jclepro.2017.11.084>.
- Richardson, J., 2008. The business model: an integrative framework for strategy execution. *Strateg. Chang.* 17 (5–6), 133–144. <https://doi.org/10.1002/jsc.821>.
- Suchek, N., Ferreira, J.J., Fernandes, P.O., 2022. A review of entrepreneurship and circular economy research: state of the art and future directions. *Bus. Strateg. Environ.* 31 (5), 2256–2283. <https://doi.org/10.1002/bse.3020>.
- Trautwein, C., 2021. Sustainability impact assessment of start-ups – key insights on relevant assessment challenges and approaches based on an inclusive, systematic literature review. *J. Clean. Prod.* 281 <https://doi.org/10.1016/j.jclepro.2020.125330>.
- Urbanati, A., Chiaroni, D., Chiesa, V., 2017. Towards a new taxonomy of circular economy business models. *J. Clean. Prod.* 168, 487–498. <https://doi.org/10.1016/j.jclepro.2017.09.047>.
- Valencia, M., Bocken, N., Loaiza, C., de Jaeger, S., 2023. The social contribution of the circular economy. *J. Clean. Prod.* 408 <https://doi.org/10.1016/j.jclepro.2023.137082>.
- Van der Byl, C., Vredenburg, H., 2015. The challenge of mission drift through growth in the hybrid organisation. *Int. J. Environ. Technol. Manag.* 18 (4), 309–329. <https://doi.org/10.1504/IJETM.2015.072130>.
- Van Opstal, W., Borms, L., 2023. Startups and circular economy strategies: profile differences, barriers and enablers. *J. Clean. Prod.* 396, 1–19. <https://doi.org/10.1016/j.jclepro.2023.136510>.
- Voss, C., Tsiriktsis, N., Frohlich, M., 2002. Case research in operations management. *Int. J. Oper. Prod. Manag.* 22 (2), 195–219. <https://doi.org/10.1108/01443570210414329>.
- Wales, W.J., 2016. Entrepreneurial orientation: A review and synthesis of promising research directions. *Int. Small Bus. J.* 34 (1), 3–15. <https://doi.org/10.1177/0266242615613840>.
- Walker, A.M., Opferkuch, K., Roos Lindgreen, E., Simboli, A., Vermeulen, W.J.V., Raggi, A., 2021. Assessing the social sustainability of circular economy practices: industry perspectives from Italy and the Netherlands. *Sustainable Production and Consumption* 27, 831–844. <https://doi.org/10.1016/j.spc.2021.01.030>.
- Zahra, S.A., Ireland, R.D., Hitt, M.A., 2000. International expansion by new venture firms: international diversity, mode of market entry, technological learning, and performance. *Acad. Manag. J.* 43 (5), 925–950. <https://doi.org/10.5465/1556420>.
- Zott, C., Amit, R., 2010. Business model design: an activity system perspective. *Long Range Plan.* 43 (2–3), 216–226. <https://doi.org/10.1016/j.lrp.2009.07.004>.