

Business models for the circular economy: Empirical advances and future directions

Circular economy has become a very popular topic worldwide, not only among policymakers, entrepreneurs, citizens but also academics (Fraccascia, Giannoccaro, Agarwal, & Hansen, 2019). National strategies and initiatives have been deployed in many European countries (e.g., acatech CEID and SYSTEMIQ, 2021). According to Scopus and Web of Science databases, the scholars' interest in the circular economy has grown almost exponentially in the last decade, moving from about 10 papers published in the year 2010 to over 2000 papers published in 2020.

In the last 10 years, many definitions of circular economy have been provided—readers interested to deepen such issue are referred to the review by Kirchherr et al. (2017). A mature definition of circular economy is provided by Geissdoerfer et al. (2017, 759), who defined circular economy as “a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling”. Three main principles are the pillars of circular economy: (1) preserving and enhancing natural capital by controlling stocks of non-renewable resources and balancing renewable resource flows; (2) keeping products and materials in use at most in both biological and technical cycles; and (3) designing out wastes and negative environmental externalities such as pollution (Ellen MacArthur Foundation, 2015). These principles are inspired by previous concepts such as industrial ecology (Frosch & Gallopulos, 1989), the “cradle-to-cradle” concept of eco-effectiveness (Braungart et al., 2007), and cleaner production (Stevenson & Evans, 2004). Given the scope from firm-level product design, via collaborations across the value chain, to the infrastructures for product take back and related consumer action, the circular economy needs system innovations.

A critical factor for supporting the circular economy transition is the development of circular business models. Circular business models are a subset of “business models for sustainability”, that is, business models able to “create competitive advantage through superior customer value and contribute to a sustainable development of the company and society” (Lüdeke-Freund, 2010, p. 23; see also Bocken et al., 2014; Boons & Lüdeke-Freund, 2013; Schaltegger et al., 2016; Fraccascia, Giannoccaro, & Albino, 2019). Circular business models explicitly link the business model to the product life-cycle (Hansen et al., 2009) and are a vehicle to slow and/or close (additionally also narrowing) resource cycles (Bocken et al., 2016). This requires to embrace not only upstream aspects such as product design but also

downstream “circular service operations” (Hansen & Revellio, 2020; see also Urbinati et al., 2017). Orchestrating collaboration across constituencies in the value cycle (Hansen & Schmitt, 2021) and related business model ecosystems (Konietzko et al., 2020) becomes key in this endeavor.

The research field of circular business models, while very dynamic, is still strongly characterized by conceptual advances, for instance, conceptual taxonomies or typologies (Centobelli et al., 2020; Fraccascia, Giannoccaro, Agarwal, & Hansen, 2019; Lüdeke-Freund et al., 2019)—the share of empirical studies is only increasing more recently. This special issue contributes to the academic debate collecting six empirical papers concerning the development and implementation of circular business models. Each paper tackles a specific set of opportunities—that is, how organizations can (further) develop their current business from the perspective and through adoption of circular business models—and challenges—that is, how organizations can identify and manage risks—related to these models (Table 1).

The first two papers focus on the single-company perspective.

- The paper entitled “Circular business model implementation: a capacity development case study from the manufacturing industry” by Wiebke Reim, David Sjödin, and Vinit Parida investigates how the implementation of circular business models in manufacturing companies can be facilitated by circular business model selection and capability development. Through a multiple case study involving three large Swedish manufacturing companies, the paper develops a circular business model implementation framework composed of two parts. The first part supports the selection of the most appropriate circular business model for a particular product in a specific market. The second part concerns capability development and supports companies in moving to more advanced circular business models. Overall, the results highlight that there is no one-size-fits-all solution, suitable for all companies, to implement circular business; alternatively, a careful analysis of the choice factors is necessary.
- The paper entitled “Unravelling the design process of business models from linear to circular: an empirical investigation” by Simone Franzò, Andrea Urbinati, Davide Chiaroni, and Vittorio Chiesa investigates how companies can implement circular business models through a set of managerial practices in order to launch circular products into the market. A multiple case study involving four companies in the paper and beverage industry that have launched six circular products is conducted. The paper

TABLE 1 Opportunities and challenges of circular business models addressed by papers belonging to this special issue

Paper	Opportunities	Challenges
Reim et al. (2021)	Circular business models can create new value for manufacturing industries	Companies should identify the circular business model that is best suited to the firm's prevailing situation
Franzò et al. (2021)	Companies can launch new circular products into the markets	Companies must develop ad hoc managerial practices to support circular business models
Toxopeus et al. (2021)	Companies can have access to external finance to implement circular business models	Acquisition of external finance for circular business model innovation might be not easy for small and medium companies, as well as for startups
Tunn et al. (2021)	Through business models based on product-service systems, companies can satisfy consumer needs through bundles of products, services, and infrastructure, potentially decoupling needs satisfaction from resource consumption	The success of business models based on access-based product-service systems depends on the consumers' willingness to adopt these models
Kanda et al. (2021)	Companies can create value from wastes through being part of a business ecosystem	The success of the business ecosystem depends on the effective interaction among different organizations and coordination of the business ecosystem
Moggi and Dameri (2021)	Circular business models can create value for the society	Circular business models must be self-sufficient, from the economic perspective, in the long period

discusses how the process towards a circular business model occurs along with three major phases, defined as idea generation, product development, and commercialization. For each phase, the managerial practices adopted by companies are identified and discussed. Results highlight that the implementation of managerial practices for the first two phases (i.e., idea generation and product development) is mainly related to the value creation dimension of the business model, while the implementation of managerial practices for the commercialization phase is mainly related to the value transfer and value capture dimensions.

The third and fourth papers shift the focus from the companies' internal dynamics to those concerning the relationships that companies must operate with external stakeholders to implement circular business models.

- The paper entitled "How can firms access bank finance for circular business model innovation?" by Helen Toxopeus, Elisa Achterberg, and Friedemann Polzin focuses on the role of banks in providing external finance for circular business model innovation. Through interviews, focus groups, and archival documents, they investigate the experience of companies to access finance for circular business model innovation and assess the willingness of banks to lend to firms that engage in circular business model innovation. As a result, the authors define three strategies that companies can adopt to facilitate the successful bank finance for circular business model innovation.
- The paper entitled "Consumer adoption of access-based product-service systems: The influence of duration of use and type of product" by Vivian Tunn, Ellis van den Hende, Nancy Bocken, and Jan Schoormans concerns the barriers that hamper the consumers' adoption of access-based product-service systems. Through conjoint experiments of hypothetical short-term and long-term use AB-PSS for bicycles and clothes, they investigate whether the duration of use, the time a consumer obtains exclusive access to a specific product, and the type of product moderate the importance of the adoption barriers to consumers. Specifically, five barriers are considered: effort to access product, contamination by others, lack of trust in provider and service, quality of product, and specific product characteristics.

Finally, the fifth and sixth papers further shift the focus on the business model concept towards the business ecosystems, which include all the other stakeholders in the organizational environment that concur to the circular business model operations.

- The paper, entitled "The circular economy: From circular business models to circular ecosystems" by Wisdom Kanda, Martin Geissdoerfer, and Olof Hjelm focuses on the biogas production as a circular business model operated by several companies involved in a business ecosystem. The paper analyzes nine Swedish biogas companies and one branch organization, whose business activities are based on the circular economy principles, from an ecosystem and business perspective. It is argued that the business ecosystem view can help companies to solve coordination issues arising when multiple companies cooperate together, to show the interdependence of the various components of the ecosystems, and to highlight the environmental and economic benefits for the overall system. However, the ecosystem view requires more capabilities from companies to be able to manage these different system components.
- The paper entitled "Circular business model evolution. Stakeholder matters for a self-sufficient ecosystem" by Sara Moggi and Renata

Paola Dameri analyzes the case of a business ecosystem able to provide value for the society. Organizations belonging to the ecosystem—for example, companies, no-profit organization, and the municipality—are involved in of collecting, conserving, sharing, and supplying food and meals surplus to the poor in the local urban area of Genoa (Italy). The paper considers the evolution of the ecosystem towards the self-sufficiency, identifying the enabling factors that have permitted a compromise among stakeholders and how such stakeholders coordinate themselves for pursuing the self-sufficiency over time.

Overall, these papers show that the field of circular business models is still evolving rapidly. Key challenges of the research field lie in turning from

- conceptual to empirical evidence (both qualitative and quantitative);
- studying individual business models to collaboration across the value cycle in business model ecosystems;
- from mere technical, organizational, and sustainability aspects to financial issues (both capital required, for example, for product-service system business models, as well as the financial return from these); and
- from static representations of business models to business model innovation dynamics and related change processes—putting an emphasis on extended case methods (Burawoy, 1998), process studies (Langley et al., 2013), and broader longitudinal research methods.

This special issue is a first attempt in this direction which hopefully inspires researchers to follow this path.

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