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RESEARCH ARTICLE

Strategic Risk-Based Approach for the Circular Economy

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ABSTRACT

The current challenge of green transition is based on the circular economy (CE) as a convincing model of production and consumption. However, this transition needs to be approached by firms with a strategic attitude, that is, to blend the circular concepts within the strategy's definition and implementation and related risks. Starting from a gap in the existing literature and supported by theoretical background, we aim at identifying the key strategic risks to consider in the transition to CE at firm-level. For this purpose, we offer a conceptual framework validated by a case-study analysis. The framework acts as a valuable tool for strategic transition from a linear economy to a circular one, according to a risk-based view.

Keywords: Circular economy, Enterprise risk management, Strategy, Transition management.

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1. Introduction

The debate on the rethinking of the traditional linear-based economic model is emphasized by the increasing scarcity and volatile price of raw materials. In fact, the transition from the 'take and discard' approach can seize the benefits of the circular economy (CE) (Bocken *et al.*, 2014; Kolk, 2016; Demirel & Danisman, 2019), which is based on the 'cradle-to-cradle' thinking (McDonough & Braungart, 2002). CE considers waste as a resource, as it happens in the natural cycle model, and for this reason, it is defined as an economy able to regenerate itself (Ellen MacArthur Foundation (EMF), 2013; 2015).

Scholars and practitioners analysed the different facets of the CE, highlighting its potentialities and advantages (Fogarassy & Finger, 2020). There is, therefore, an area of concern related to the fact that CE does not seem to be that appealing (Corvellec *et al.*, 2022) because of new or unexpected risks (Gennari & Cassano, 2020; Dulia *et al.*, 2021). Ethirajan *et al.*, 2021 offer a list of seven risks categories and related 31 risks in CE initiatives. Also, the financial sector often considers circular projects not bankable because of their risks (EC, 2020).

For our knowledge, a comprehensive perspective of the strategic CE risks is lacking. This perspective involves embedding the CE fundamentals of success with the potential risks of circular strategies. Our research, considering the transition from the linear economy (LE) to the CE as a change in the business' vision, explores the following research question: "*What are the strategic risks affecting the transition from LE to CE?*". The aim of our study is not to go in-depth into the many categories of risks that can impact CE projects but to suggest a firm-level conceptual framework. This framework is grounded in an integrated approach to the CE that considers the strategic risks arising from the transition from traditional linear thinking.

To address the mentioned question, two research objectives are defined. First, we aim at identifying the key factors on which a strategic transition to CE is based and the related strategic risks. Then, we aim at proposing a conceptual framework for the identification of CE strategic risks. The research methodology integrates different theories for the development of the conceptual framework, and it validates the proposed conceptualization with a case study that deals with the content analysis methodology.

This paper contributes to both the CE literature and the CE management by emphasizing the need to approach circular projects according to the risk management view. The use of the proposed framework as a prescriptive management tool can facilitate the government of the transition by working on the identification of the main CE strategic risk areas. Hence, our study gives companies that are already committed to CE or intend to adopt circular strategies in the future an integrated model for investigating the relevance of potential CE risks with a strategy-based view.

2. Literature Review and Theoretical Ground

The definition of CE is still debating, nevertheless, there is consensus on its basic principle, which is replacing the product end-of-life concept with the so-called R-strategies (Rs)—refuse, rethink, reduce, reuse, repair, refurbish, remanufacture, repurpose, recycle, and recovery (Friant *et al*., 2020; Morseletto, 2020; Arruda *et al*., 2021, Salvioni *et al*., 2022).

The change toward CE is a transition that underpins a move from a dynamic equilibrium to another as the result of long and complex processes (Geels *et al*., 2011; Allain *et al*., 2022). The transition management (TM) theory states that changes can be deliberately influenced, focusing the stakeholders on some key factors (Geels & Schot, 2007; Jackson *et al*., 2014). Attempts to identify these catalyzing factors exist, but they are mainly focused on macro and meso-level political choices and governance instead of on the firm-level perspective (Mendoza *et al*., 2017; Brendzel-Skowera, 2021).

An abundant literature on CE discusses the key internal and external factors that can act as drivers of circular strategies. However, they can turn into obstacles when they are not properly managed, invalidating in this way the expected results and CE performance (Scipioni *et al*., 2021; Neves & Marques, 2022; Tan *et al*., 2022). Acting together, these key factors determine different transition paths of firms, according to the approach they have towards R-strategies. Hence, moving towards circularity may seem difficult, complex and risky.

A field of studies about risk management in circular activities developed (Dulia *et al*., 2021) following two main approaches. The first approach is about a generic view of the risks rooted in the traditional LE view for better-performing business management. In this context, international guidelines (Committee of Sponsoring Organisation of the Treadway Commission (COSO), 2017; Committee of Sponsoring Organisation of the Treadway Commission (COSO) & World Business Council for Sustainable Development (WBCSD), 2018) give criteria and frameworks to recognize and manage risks, also with reference to environmental, social, and governance (ESG) aspects. The second approach focuses on CE strategies for mitigating the external risks, mainly related to raw materials availability and environmental impacts (Alonso *et al*., 2007; Achzet & Helbig, 2013; Gaustad *et al*., 2018; Ethirajan *et al*., 2021).

In short, the literature review reveals great attention for transition of firms towards CE, but the existing approach is still fragmented on the two main aspects to consider in this transition:

-The identification of the circularity concept and related drivers/barriers;

-The risks that can be eliminated by abandoning the LE and those that arise with the CE.

For our knowledge, to date a comprehensive point of view on circular risks, approached considering the circular strategies in a holistic way, is missing. This evidence supports our interest in the strategic and holistic approach to CE, stimulating us in answering our research question and in providing a framework to systemize this strategic approach at firm-level.

2.1. Firm-Level Drivers/Barriers for the Circular Transition

The existing literature emphasizes some recurring barriers to CE strategies clustering them into external ones that are out of direct control by firms and depending on the time, the country, and the industry, and firm-level ones (Tura *et al*., 2019; Khan *et al*., 2022).

This risk aversion can dictate the time of the circular transition in a continuum (Holzer *et al*., 2021). It goes from a reluctant behaviour (typical of 'laggards') to a full circularity (typical of 'forerunners' rooted in CE), passing through a reactive attitude (characterizing the 'late-majority' firms that are interested in CE but unable to concretize it) and a proactive attitude (typical of 'fast followers' engaged in CE but unable to change their business model).

These different approaches could be determined by external pressures. However, what is of interest at a firm level is the related risk attitude, which can delay the circular transition because of the overestimation of internal factors that are seen as obstacles (Gennari, 2023). These are: lacking skills and capabilities and missing abilities to change the mindset of managers to long-term thinking (Liu & Bai, 2014); the lack of network and collaboration among key stakeholders (Wooi & Zailani, 2010); and the lack of proper technologies (Rizos *et al*., 2015). The same obstacles, but with a positive meaning, appear as drivers in other studies (Susur & Engwall, 2022), configuring them as ambivalent factors that, in certain contexts, can act as catalysts and in others as hindrances to CE (Sarja *et al*., 2021). They are: strategic governance characterised by a long-term vision with clear CE goals, network-building activities and organisational learning, and innovation and resources.

Many studies in business administration report, albeit separately, these factors as a basis for success and competitive advantage. A paper by Gennari (2023) categorised the previous contributions by literature on CE ambivalent factors in three clusters: governance and culture, relations, innovation emphasizing the fact that firms manage differently these factors depending on their approach to transition (reactive, proactive, innovative). A mature approach to CE requires that firms are able to holistically manage all factors for a strategic shift towards circularity.

2.2. Firm-Level Strategic Risks in the Circular Transition

The ability of an organisation to identify and manage risks determines its ability to create, preserve and realise value (Fraser & Simkins, 2016), since the risk is defined as the possibility that events will affect the strategy achievement (Committee of Sponsoring Organisation of the Treadway Commission (COSO), 2017).

Scholars emphasize the importance of a risk-focused approach to strategic management, considering the risks as points of reference in the strategic planning process and advocating a link between strategy formulation and risk management (Beasley & Frigo, 2010; Kaplan & Mikes, 2012; Gennari & Cassano, 2020). The most acknowledged risk management framework (Enterprise

Risk Management–ERM-Framework) edited by the Committee of Sponsoring Organization (COSO) in 2017 depicts three strategic risks that can compromise corporate performance: the misalignment between strategy and mission, vision, and core values. This can imply the overcoming of the desired risk profile (or risk appetite); the risks associated with the chosen strategy within the risk profile defined by mission and vision; and the risks that arise during the strategy execution.

3. Research Design

As emerges from the previous section:

- The main key factors for a strategic development of CE strategies are attributable to external and internal (firm-level) drivers. In our research design, we focus on internal drivers because they can be considered as points of attention which, according to the transitions management theory, can be managed by firms and used as catalysts for circular change. They have been identified in culture and governance, relations with stakeholders, and innovation;
- The engagement in circular transition depends on the firms' attitude toward the key factors. The 'laggards' don't recognize the benefits and the opportunities of circularity and remain in their linear convictions. For this reason, they are not considered in the suggested framework because they are not interested in the transition. The 'late majority' leaders, often influenced by external pressures from authorities and stakeholders, are involved in circular initiatives that do not require special skills, are based on occasional relations within the value chain, and are not pushed by an innovation impetus because too focused on current costs of circularity. The 'fast followers' are engaged in coherent circular strategies with the collaboration of some categories of stakeholders. They are able to innovate products, but they are not able to innovate their business model. The 'forerunners' manage the shift from linear to circular approach in an integrated way thanks to: a leadership attitude rooted in circular principles and shared with the organization; a strong collaboration with stakeholders for the co-creation of value; and a radical innovation thinking;
- The strategic risks are related to strategic coherence with mission, vision, and core values, strategy assessment, and strategy achievement within the organisation.

These are the theoretical propositions and issues we refer to for the development of the conceptual framework. The grid in Fig. 1 crosses the issues taken as propositions. The intersection between strategic CE factors and strategic risks highlights nine areas in which lies the potential success or failure of CE strategies.

To validate the suggested framework, we conducted a case study analysis (Miles & Huberman, 1994). In particular, we used the directed single-case content analysis to validate the theoretical propositions (Yin, 2003; Stake, 1995) with a deductive category application (Mayring, 2000). To overcome the limits of this methodology, we assure validity (Jones & Shoemaker, 1994) and reliability (Morse & Richards, 2002) of our study. To support the validity, we compared information from different sources about the same topic (website information, different types of reports, press conferences, scientific articles talking about the analysed case study), in order to create a sort of triangulation (Bengtsson, 2016). In order to improve reliability, we developed a deductive coding scheme from conceptual framework propositions (Catanzaro, 1988), in order to make the process transparent from data to results, minimising the cognitive changes during the analysis. Content was divided into the following information categories: 'Governance' (including corporate culture, organisational structures, resources and processes as activities which transform resources into results thanks to the existing organisational structure), 'Relations' (relationships with internal and external stakeholders), 'Innovation' (as novelty both in products/processes and in the organisation of human resources) (Gennari, 2023). This coding scheme allows us to gather general constructs into intellectual "bins" (Miles & Huberman, 1994), linking data to propositions (Yin, 2003).

Furthermore, the content analysis, done on secondary voluntary sources of information, has a potential limit related to asymmetric information and the risk of greenwashing reporting. However, the use of the international standards of sustainability reporting, such as GRI, and the inclusion of the Company in nine different sustainability indexes induce us to accept substantial reliability of the information.

Following the above methodological structure, content analysis was applied to the Enel case study, in the period from January to March 2023 using the following sources: Enel website, 2022 Sustainability Report, 2021 Code of Ethics, 2022–2024 Strategic Plan, 2020 Circular Economy Enel Position Paper, 2022 Journey into the Economy Circular from the Enel Group-Strategies, projects and results, Enel Group Corporate Governance Guidelines. Enel is one of the biggest energy companies worldwide (it works in over 30 countries) strongly committed to the green transition for carbon neutrality, playing an active role in the development of innovative solutions for a more circular and sustainable economy. In particular, Enel X is a Group's division for advanced energy services concretely applying the five business models of the circular economy (Tagliafierro, 2020).

Enel produces information beyond the legal requirements, making it possible to make significant observations for this study. All available information within the corporate internet site and other sources were analysed in their content with respect to the research coding scheme.

4. Findings

The company identifies six most significant categories of risk, which it manages with three lines of defence (management, control, and internal auditing): strategic, governance and culture, digital technology, financial, operational, and

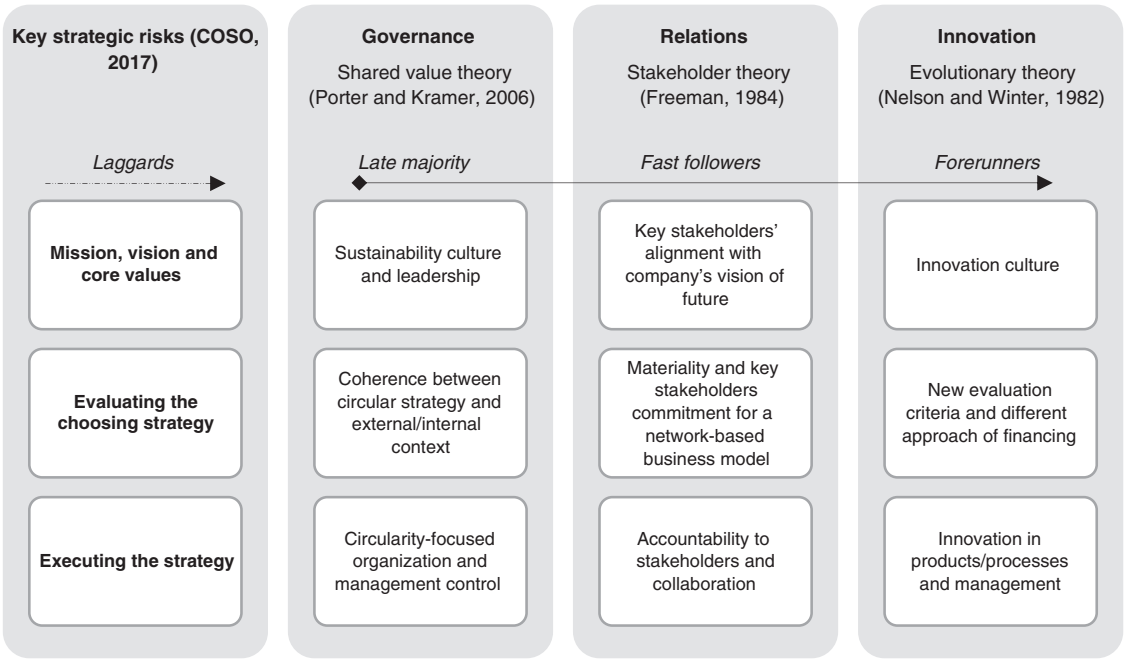

Fig. 1. Conceptual framework.

compliance. We organised these categories according to our framework in order to fill (or not) the nine boxes we identified.

The analysis of Enel X information highlighted the fact that the company oversees the key factors of CE according to a risk-based approach. Corporate governance, relations with stakeholders, and innovation emerged as areas managed at all stages of circular strategies' development, starting from corporate mission, vision and core values. The role of CE for the development of the company is depicted in the 2022–2024 Strategic Plan. The innovation is a circularity accelerator, and the importance of maximum collaboration between all the key players starts from the Company's vision, which defines the circular economy as a strategic driver of development.

4.1. Coding Category: Governance

The approach to CE is clearly defined by Enel X according to the sustainability culture shared within the Group. This belief is realised thanks to a corporate structure, which enables the knowledge and the achievement of circular corporate goals by all the company's levels involved in the circular projects, starting from leadership bodies (a devoted committee within the Board of Directors and an Executive Director) to managers (organized in Departments) and Officers within the organization. This structure allows the Company to manage its circularity, according to a strategic approach. The formulation of circular strategies, which are coherent with the context (scenario analysis), and the use of circular metrics and assessment methods (CirculAbility model, circular KPI, circular EBITDA, metrics in line with EDP) support the validity of current and future projects. CE strategies are implemented thanks to: a circularity-focused organizational structure based on business lines and functions, both at central and peripheral levels (Global Business Lines and Functions); activities and processes measured by key performance indicators, according to the management control thinking (circular KPI); and an accountability system based on ESG and products life cycle assessment (Environmental Product Declaration).

4.2. Coding Category: Relations

Relations with internal and external stakeholders are expressed by the Company as a fundamental requirement for the development of circular business models. Enel X shares many circular projects with different actors in order to develop a broader knowledge of CE. It is possible thanks to different approaches and perspectives and by being strong committed to the dissemination of the culture of circularity, both towards internal and external stakeholders. A formalised stakeholder engagement system assures that the company evaluates its strategies in relation to their level of priority. Enel X's experience in the matter is made available also to other companies and public administrations, by means of advisory tools. In this way, they are able to assess the sustainable feasibility of their own strategies. This supporting role by Enel X distinguishes also the strategy achievement, emphasising the importance of mutual relations for improving company's circular performance and stimulating other stakeholders' circular approach. In this context, the Company has formulated a tool (called scale of circularity) to allow clients and customers to assess their circularity level.

4.3. Coding Category: Innovation

Innovation is a growth accelerator for sustainability and energy transition in accordance with the circular way of doing business. The Company declares the critical issue of innovation as a novelty, in both technology and business models. Innovation plays a noteworthy role in the materiality matrix, which supports future strategic choices for Enel X, but also for other actors involved in shared projects (Open Innovability–a digital platform to

collaborate with stakeholders and Innovation by Vendors–a network for knowledge sharing). A devoted corporate function (Innovability Function) and specific model assess the commitment for innovation as functional to CE.

The case study confirms that the key factors (governance, relations, and innovation) are appropriately managed in all the steps of strategy's statement and realisation, in order to assure the success of circular projects. These factors are essential blocks for the corporate transition towards innovative circular business models. This approach interests all the phases of the development of circular strategies: coherence with mission, vision and values, appropriate organisational structure, tools to monitor and assess the achievement of the established circular objectives, and communication and reporting. According to the code protocol, the findings on the content of the case study (website, reporting and other sources) verify the conceptual framework we have designed in Fig. 1.

5. Discussion

The analysis of Enel X case study, according to the chosen methodology, gave us results which, based on grounded theory (Heat & Cowley, 2004), enable us to adjust the conceptual framework. In particular, we turned the results into open questions. The related answers lead firms to a critical thinking about the transition stage they are going through. So, the results allow us to complete the grid in Fig. 1 with topics (expressed as questions) that an organisation should monitor for having a complete view about the strategic risk of its CE projects (Fig. 2).

The risk management process, suggested by ERM Framework, states that the steps of risks assessment and risks response follow the risks' recognition. Hence, the first and most important phase for an effective risk management process is the clear and conscious identification of the main strategic risks, according to an integrated view and considering that the key CE factors (governance, relations, and innovation) support each other in the definition and the achievement of circular strategies and policies. The suggested conceptual framework needs to be adapted according to the size and the CE maturity stage of the firms. In particular, it can be useful for small organizations, which are experiencing their circular transition or are going to begin it, in order to gain awareness about the CE challenges for their organization and their related risk approach.

The questions in the conceptual framework regarding the factor 'Governance' aim at raising the main risks referring to the poor belief by leaders about the circularity benefits for both the firm and the community (Agyemang *et al*., 2018; Mangla *et al*., 2018; Gennari & Salvioni, 2019), and the consequent risk aversion (Tura *et al*., 2019; Ritzén & Sandstrom, 2017; Susur & Engwall, 2022). This situation can lead to a sustainability facade which gathers stakeholders support thanks to some circular actions, but that doesn't permeate the culture and the strategic decision-making process. In this way emerges the risk of circular-washing, which neglects the impact of such actions on the environmental and social sphere (Greening *et al*., 2000; Isenhour, 2010; Watson, 2016; Kopnina, 2019).

Indeed, these firms make circular projects without a circular thinking and mission, remaining locked-in in the current linear system (Kirchherr *et al*., 2018). There is no interest in having human resources really engaged in CE and with useful skills towards a real overcoming of the linear mentality during the formulation, the assessment, and the achievement of strategies. For the same reason, investments in management tools to measure and monitor the circular performance and changes in the business model are not properly considered. This is also the case of firms that mistakenly think to be circular because of the adoption of only one circular R-strategy, such as recycling, suffering a lack of understanding of CE concept (Rizos *et al*., 2015; Mahpour, 2018). Such companies make claims to promote circularity, but limit their efforts to only certain parts of their activities (Stål & Corvellec, 2018).

The questions about the factor 'Relations' were designed to bring out the risk of inability to create a system of multi-stakeholder relationship management, based on a reconfiguration of responsibilities, in the way stakeholders and companies affect and relate to each other (Brondoni *et al*., 2019). The effective implementation of a CE model requires that stakeholders play an active role in circular processes. When a company is not able to align stakeholders with its circular vision and mission, their interest in being part of this vision and mission can be missing, and they might not be willing to spend their time to take part in a project that they deem not feasible or not convenient (Vonk, 2018). Also, the misalignment of values between a company and its supply chain can change the meaning of cooperation, which is viewed as intrusive within business models and not economically beneficial (Agyemang *et al*., 2018). Hence, there is the risk that CE projects are based on fragmented and dispersed value within the value chain, being not as radical as they should be (Hofmann, 2019). These risks can be reduced thanks to a well-planned stakeholder engagement process.

Furthermore, the communication with internal and external stakeholders can be a tool to reduce the risk of value misalignment, according to the concept of double materiality. This concept emphasises the interconnectivity between an organisation's development, its performance and position, and the environmental and social impacts of its activities on a broad range of stakeholders (Adams *et al*., 2021). Without a responsible accountability, it is not possible to create a collaborative network (Adams, 2004; Beske *et al*., 2020). The CE-specific reporting requirements within the European CSRD should be a step in the right direction (Opferkuch *et al*., 2022).

The risks associated with 'Innovation' are expressed by questions mainly oriented to bringing out the lack of innovative impetus and the inability to translate the CE concepts into strategy and business model (Pieroni *et al*., 2019; Khan *et al*., 2022). Linear economy technologies, although inefficient, define a comfort zone that is difficult to overcome. This is due to the uncertainty about the value produced by circular processes for different categories of stakeholders (Korhonen *et al*., 2018; Manninen *et al*., 2018; Hart & Pomponi, 2021). The risk of declaring the adoption of CE concepts using linear technologies or making incorrect assessments in CE investments can be

Fig. 2. Conceptual framework of CE strategic risks.

managed by struggling to change the traditional point of view. This can be done by means of new investments' assessment tools.

The CE cannot be conceived and implemented without a clear definition of what constitutes value (Velis, 2018), how to measure this value, and how to translate it into economic, social, and environmental performance indicators. This new way of thinking about the concept of value should emphasize the need to evaluate the validity of the existing business model and possibly review it. In fact, business model innovation represents a better driver of transition towards sustainability than technological innovation alone (Girotra & Netessine, 2013). Debating the negative meaning of value, the so-called value uncaptured (Yang *et al.*, 2017), can help in stimulating innovation in business models in order to discover new value opportunities that the traditional business models are unable to catch. Therefore, it is necessary to ensure that the current and perceived economic, social and environmental benefits of investments in

new circular models are established, according to the multi-stakeholder vision (Casalegno *et al*., 2020), more solidly than in traditional cost-benefit analysis.

6. Conclusion and Implications

By adopting CE business models, companies can mitigate the risks related to the market (such as the commodity and energy price fluctuations and the extended linear supply-chains discontinuity) and to the business (such as the climate-related financial risks and the reputational damage) (Ellen MacArthur Foundation (EMF), 2021). However, the CE itself must be managed according to a strategic risk-based approach to minimise the risk of its failure due to a fragmented circular vision within the organisation.

Recognising that scholars and practitioners have dealt with the risks that CE can mitigate, paying less attention to the risks inherent in the CE strategies formulation, this paper has tried to focus the attention to the importance of considering the circular approach as a strategic issue, to incorporate into the organisation's vision of the future, and on the factors potentially affecting the achievement of company's circular strategies. By being anchored in the transition management theory, this paper stresses the fact that the main strategic risks related to CE are hiding in the fundamental CE drivers (governance and culture, relations with stakeholders, and innovation). Each of these drivers contributes to the success of circular strategies.

Although there have been attempts to contextualise the theme of risk in CE projects, the novelty of this research and its contribution to both academic literature and practitioners can be the following. Theoretical implications refer to the attempt to fill an existing gap within the CE literature, studying the key drivers of CE with the lens of strategic risk definition given by the ERM Framework. In fact, while governance, relations and innovation are referred by the literature as the key factors to manage for a holistic transition to CE, existing research do not analyse these factors as potential risk areas, which can negatively impact on the expected performance of circular projects.

The unfragmented vision of circularity is the basis for a strategic CE approach, overcoming the risk of committing resources to different isolated R-strategies, which do not share the company vision. The results of our analysis suggest that large companies have mastered circular thinking in its many facets. On the other hand, smaller companies should be educated and supported in their circular transition, thanks also to conceptual frameworks.

Managerial implications of our research consider the fact that the transition to CE is a process characterized by different commitment stages (Munn *et al*., 2018), also depending on the size of the firms. The suggested framework aims at supporting firms-in particular, the ones that haven't achieved a high maturity level regarding CE-in their conscious approach to circular thinking with a tool that facilitates the identification of the main strategic risks to be faced in circular projects. In this context, we aim at stimulating a different way of thinking, rather than providing a list of circular risks.

Furthermore, our research could have societal implications by stimulating critical thinking in circular strategies. The underestimation of potential circular risks, which is typical of circular acts still rooted in linear thinking, can determine the failure of circular projects and their perception as occasional greenwashing actions.

Admittedly, this study has limitations. First, we based our considerations on the known literature and our research ability. CE is a much-discussed topic, especially in recent times. Therefore, in the writing phase of this article, we may have ignored some contributions to the subject. Furthermore, the paper suffers from the limitations typical of the case study methodology, in particular, the critique about the fact it is an easy and not particularly rigorous research method (Baškarada, 2014). Additionally, we are conscious that by using secondary data, we can face the company's external declaration instead of the company's real operations.

Considering these limitations, we like to suggest future research to test the developed conceptual framework within organisations, using other methods of research and with adjustments based on different firms' dimensions (with particular attention for the SMEs) and industries.

Conflict of Interest

The author declares that she does not have any conflict of interest.

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