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BARRIERS TO IMPLEMENTING CIRCULAR ECONOMY LEARNING PROCESSES IN THE CONSTRUCTION SECTOR: AN ANALYSIS OF ITALIAN SMES

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Abstract

This paper examines the application of circular economy (CE) solutions in the Italian construction sector, particularly in small and medium-sized enterprises (SMEs). Specific attention is given to identifying barriers that influence the development of organizational learning (OL) processes related to circular business model (CBM) implementation. Using a qualitative method informed by grounded theory, top managers' perceptions in Italian construction SMEs were investigated using a focus group methodology. The data analysis followed a rigorous method for iterative coding and interpretation relying on the theoretical insights found in OL and CE literature. The study highlights CBM-oriented OL barriers in the external environment, the supply chain context, and individual organizations. In particular, the study identifies culture as a critical multilevel barrier embedded in the other three dimensions. The paper offers several theoretical, managerial, and policy implications, answering a call for CE-related studies in industrial contexts. It furthermore underlines the relevance of OL processes as an essential preliminary step for CBM implementation.

1. Introduction

In recent years, the circular economy (CE) has become a prominent topic in organization science as a new way to understand the relationships between firms and society and pursue a more environmentally oriented business model. Organizations need to learn how to develop and implement this new perspective of a sustainable economy, characterized by different economic paradigms, innovative business models, and novel supply chain (SC) management strategies. Starting from these premises, this paper aims to analyse the barriers to the learning processes needed to implement circular business models (CBMs) in the construction sector. In this context, the organizational learning (OL) theory – here conceived as multiple processes of creating, retaining, and transferring knowledge (Argote, 2011) – is useful to understand the contextual elements that can hinder extensive application of CBM-oriented OL processes. OL theory is also valuable for highlighting the critical role that learning processes play in supporting organizational resilience (Buheji & Ahmed, 2020).

The study focuses on the application of CBMs in small and medium enterprises (SMEs). SMEs represent the largest portion in terms of the number of firms and added value to the national economy. As a key result, contextual elements related to the external environment, supply chain context, organizational features, and culture are emphasised as the main barriers to a CE-oriented evolution of construction SMEs. Additionally, the contribution of specific learning processes oriented towards developing a CE-oriented culture is highlighted as a possible solution to overcome the identified barriers.

This paper provides a theoretical background of OL and previous literature on CE, CBMs, and related barriers, focusing particularly on SMEs. The paper then introduces the research context and methodology, followed by the presentation and discussion of the results. The last section outlines the implications of the research, limitations, and avenues for further research.

2. Theoretical background

2.1 The circular business model and implementation issues

The transition towards a circular conception of the economy and, in connection, CBM implementation can be considered a radical change for traditional firms. CE is a novel economic approach oriented to replace the existing linear production model, where "raw materials are extracted, processed into finished products and become waste after they have been consumed," with a system "that reuse[s] resources and conserve[s] ener-

gy" (Urbinati et al., 2017:488). Several CE definitions (e.g., Kirchherr et al., 2017), taxonomies (e.g., Urbinati et al., 2017), and business models (e.g., Bocken et al., 2014) have been proposed and discussed in academic and practitioners' debates, leading to conceptual confusion and challenging the applicability of this paradigm.

Several different business models are available and under discussion (Bocken et al., 2014; Lewandowski, 2016; Pieroni et al., 2019), but they give "no clear and authoritative guidance on CE principles, strategies, implementation, and monitoring" to organizations (Pauliuk, 2018: 81). This undefined panorama of CBMs' definition and application at the practical level is worsened by the presence of CE-related barriers highlighted in specific studies (Tura et al., 2019), some of which are related explicitly to SMEs (Rizos et al., 2016). Some specific barriers are generally linked to CE application – such as local culture, regulations against CE, or conservativeness of business practices (Tura et al., 2019) – while others are related to intrinsic characteristics of SMEs, such as limited personnel and scarce financial and structural resources to dedicate to CE solutions (Rizos et al., 2016).

In our study, CBMs are defined as the way companies "create, capture, and deliver value with the value creation logic designed to improve resource efficiency through contributing to extending the useful life of products and parts (…) and closing material loops" (Nußholz, 2017:12), underlining the necessary inter-organizational relations among the CE-relevant actors of the supply chain. We propose that to effectively apply CBMs, organizations – and most of all SMEs – need to activate precise learning processes across the different OL levels (individual, team, organizations, and external networks) that are oriented to clarify how to use the most appropriate CBMs in a specific organizational context and to overcome the actual barriers related to CE.

In this context, the British Standards Institution (BSI, 2017) has developed and launched a new standard called "BS 8001:2017 - Framework for Implementing the Principles of the Circular Economy in Organisations" (BSI, 2017; Pomponi & Moncaster, 2019). The BSI standard conceptualizes six different CBMs and offers a valuable framework to provide conceptual and practical clarification of CBMs (Pauliuk, 2018). Taking into account the actual debate on the BSI's standard (Pauliuk, 2018) and answering the call for a better understanding of CBM application in specific contexts (Pieroni et al., 2019), our study focuses on analysing the barriers to implementing OL processes related to CBMs in the construction sector, which is considered the first step for CBM application. Considering the relevance of those organizations, this analysis explicitly examines SMEs (European Commission, 2019) and managers' perception of the contextual elements that influence CBM-oriented OL processes in the construction sector.

2.2 Organizational Learning and the Circular Economy

Organizational learning (e.g., Argote, 1999) focuses on a comprehensive understanding of learning processes, the actors involved, and contextual factors at individual, group, organizational, and inter-organizational levels (see for review, e.g., Bapuji & Crossan, 2004). In this analysis, we understand OL to include multi-level processes of knowledge creation, transfer, and retention (Argote, 1999), a definition that shares several perspectives of the knowledge management (KM) literature (e.g., Nonaka, 1994). In particular, we mainly focus on the organizational and inter-organizational OL levels; The general application of CBMs requires that all the relevant stakeholders be embedded in those two dimensions and, thus, the related preliminary activation of OL processes. In this regard, our aim is to identify the main barriers to CBM-oriented OL processes at the organizational and inter-organizational levels and possible OL processes related explicitly to those levels.

Proposition 1: SMEs need to activate OL processes – i.e., knowledge creation and transferring and retaining processes – as a preliminary step in CBM implementation at organizational and inter-organizational levels.

The OL literature has a long tradition of analysing contextual elements that might hinder learning processes. A seminal work by Fiol and Lyles (1985) identifies a set of contextual factors – or barriers – that influence OL processes. Informed by this conceptualization, we aim to identify the most relevant contextual elements that might hinder CBM-related OL processes. In particular, in the light of OL and CE literature, we propose three main sets of contextual factors: external environment, supply chain context, organizational features, and culture.

First, it is well known that the external environment influences an organization's learning capability; in fact, usually learning processes might not be developed when the external environment is too much stable to stimulate them, or when too much change occurs (March & Olsen, 1975). Here, the external environment is considered the macro-level environment composed of external stakeholders, from institutional bodies to customers and competitors. In CE, considering the level of uncertainty due to evolving regulations and the lack of shared guidelines, the external environment might negatively influence CBMs' implementation. Additionally, external stakeholders – such as commissioners, customers, and general society – can act as a specific barrier if CE-related knowledge and environmental, economic, and social value are not adequately diffused and promoted among society (Hueske et al., 2015).

Proposition 2: The external environment – represented by external stakeholders, such as customers, public institutions, and representative bodies – acts as a macro-level contextual element in CBM-oriented OL processes at the organizational and inter-organizational levels.

Second, though embedded inside the external environment, the supply chain context needs to be analysed as a separate dimension. It is considered a specific cluster of related organizations working together to manage materials and information from suppliers to the final customer (Christopher, 2011). This choice is due to the necessary inclusion of supply chain actors in CBM application, and this particular group of stakeholders might act as a barrier to learning processes in a different way respect to the general external environment actors. CE asks supply chain actors to collaborate and contribute to the environmental, economic, and social advantages related to CE (Geissdoerfer et al., 2018). Concerning inter-organizational OL processes, the characteristics of the internal operations of the organizations involved in the relationship (Szulanski, 1996; McLaughlin et al., 2008), the availability of organizational resources (Barson et al., 2000; McLaughlin et al., 2008), and the presence of boundary spanners (Schilling & Fang, 2014) and informal structures (Wenger, 1999) might influence the occurrence of OL processes within relationships developed among supply chain organizations. Thus, we propose to identify a supply chain-related subset of contextual elements linked to OL processes.

Proposition 3: The supply chain context – represented by interconnected organizations working together to manage specific product- or service-related flows of materials and information – is embedded in the external environment and identifies a separate set of contextual elements related to CBM-oriented OL processes at organizational and inter-organizational levels.

Third, organizational features – here identified as a set of organizational in/formal structures, management, and processes (Dalton et al., 1980) –influences the occurrence of OL processes of knowledge creation, transfer, and retention at the organizational level. For example, OL usually develops from planned activities to transfer knowledge, such as training and runs of practices (Nembhard & Tucker, 2011). Thus, the absence of dedicated structures (Kane & Alavi, 2007; Dodgson et al., 2013) and related activities is an organizational element that might act as a barrier in OL processes.

Organizational barriers related to internal structure can also affect inter-organizational learning processes. For instance, a lack of formal KM processes for knowledge transfer and retention (Cerchione & Esposito, 2017; Styhre et al., 2006) might affect the activation of collaborative learning processes among organizations. Concerning CBM implementation, overcom-

ing these barriers can be considered essential to create, diffuse, and retain CE-related knowledge among organizational and network actors.

*Proposition 4: A single organization – characterised by organizational in/formal structures, management, and processes – is embedded in a specific supply chain context and identifies a set of contextual elements related to CBM-oriented OL processes at organizational and inter-organizational leve*l.

Fourth, some contextual elements can be explicitly related to different conceptualizations of culture. Here, we consider culture to be a multi-dimensional element (Erez & Gati, 2004) that encompasses external, inter-organizational, and organizational levels. In particular, we identify three different concepts: national, collaborative, and CE-oriented organizational culture. For the first dimension, we identify stakeholders' culture to relate to a national society's cultural disposition for sustainable and CE-related solutions. This macro-level culture is generally critical for OL, as external contingencies often stimulate OL processes for legitimacy and contribution to isomorphic change in organizations (Powell & DiMaggio, 2012); in addition, national culture is considered a known CE-related barrier that should be taken into account (Tura et al., 2019).

As for the second dimension, the collaborative supply chain culture – here represented by top management's cultural orientation towards collaboration at the inter-organizational level – is a relevant aspect for collaborative OL processes (Feller et al., 2013). As collaboration among supply chain actors is considered essential for full application of CE principles, identifying this specific culture is vital to fully apply CBMs and related learning processes along the supply chain (Silvestre et al., 2020). For the third dimension, we focus on CE-oriented organizational culture, as promoted by top management. Organizational culture is proven to be a critical element for the introduction of technical innovation and effective OL (Sanz-Valle et al., 2011), as cultural resistance to change is one of the most prominent barriers in changing environments (e.g., Smith & Elliott, 2007).

In this context, managerial and cultural orientation towards sustainable and CE-related solutions seems essential for the development of CBM-related learning processes – especially in SMEs where management has a critical role (Durst & Wilhelm, 2012).

Proposition 5: A multi-level representation of culture – composed of external environment-related, supply chain context-related, and organization cultural dimensions – represents a critical contextual element related to CBM-oriented OL processes at the organizational and inter-organizational levels.

Overall, the activation of CBM-oriented OL processes and consideration of the proposed OL contextual elements – the external environment, the supply chain context, organizational features, and multi-level culture – seem to foster a better understanding of the preliminary phases of CBM implementation in specific contexts. In our study, we explore our propositions on Italian construction SMEs concerning CBM introduction.

3. Methodology

This exploratory analysis focuses particularly on construction SMEs since they represent an essential part of the European and Italian economy[1]. Italy has peculiar aspects related to CE, such as being the third country in Europe to register products with the European environmental mark "Ecolabel" and being one of the seven most advanced European nations in terms of eco-innovation and CE activities. Furthermore, Italy is fifth in Europe in terms of reusing secondary raw materials, with a 17.7% utilization rate (Circular Economy Network & ENEA, 2020). Therefore, Italy is an interesting case to study CE initiatives, also due to the lack of specific studies on construction firms concerning the application of CBMs and related learning processes. (Scipioni, 2021)

In this research context, a qualitative methodology was used to understand the most relevant characteristics of CBM-oriented OL barriers in Italian SMEs. The focus group methodology (Freeman, 2006; Morgan, 1997) was chosen to investigate different perspectives on this particular topic and initiate in-depth conversations among informed participants (Cassell & Symon, 2004; Morgan, 1997). Considering that personal points of view can significantly influence perceived barriers, focus groups help identify more objective shared concepts – here, barriers – by comparing the participants' responses. The focus group method facilitates forming a shared perspective of analysis resulting from the interactions among participants.

To develop this analysis, we contacted the leading professional association related to the Italian construction sector[2] to evaluate its associates'

[1]In the Italian context, SMEs are an essential part of the economy; in 2018, 97.7% of Italian firms were SMEs, and in the construction sector, SMEs represented 95.3% of all firms (ISTAT, 2019). Italian SMEs are extremely competitive on a global level, thanks to their ability to innovate and create local and international commercial activities (Della Torre & Solari, 2011). It's no coincidence that Italian SMEs produce 66.9% of the overall added value of the Italian economy (European Commission, 2019). Among SMEs, construction firms have an important impact on the Italian economy. In fact, in 2019, the production in the construction sector grew by 3.7%, as compared to 2018 (Banca d'Italia, 2019).

[2]ANCE is the Italian Association of Building Constructors, a part of the General Confederation of Italian Industry (Confindustria). It includes all relevant construction stakeholders, including manufacturers and retailers of building materials, technicians, professionals, public and private builders (ANCE, 2020)

perceptions of CBM-related OL barriers across the country. On the basis of previous studies (Cassell & Symon, 2004; Freeman, 2006; Morgan, 1997), four focus group discussions were conducted over two days to ensure an adequate discussion on the research topic. The health emergency related to the pandemic crisis presented a significant challenge to both organisations and research activities (Braun et al., 2020) and influenced this planned data collection methodology. Nevertheless, the focus group discussions took place virtually on the Zoom platform, which allowed a valuable video and audio interaction between the participants.

Among the associates' responses received, a balanced sample of 24 executives was formed (6 in each focus group) to guarantee balanced coverage of Italian territory. During the discussions, the six CBMs from the BSI were presented to allow participants to precisely examine the related OL barriers. A focus group methodology can limit the generalisability and replicability of results, as some participants' possibly dominant position in the discussion risks limiting the overall interaction (Guest et al. 2017; Smithson, 2000). To manage this possible limitation, one researcher coordinated the sessions and moderated the participants' discussion and interventions, while another was responsible for providing technical support and time management.

After each session, the discussions were fully transcribed and double-coded by two researchers using NVIVO 12 plus a computer-assisted qualitative analysis program. The coding and interpretation phases were conducted by the authors, who examined the data through an iterative comparison process informed by the logic of grounded theory (Suddaby, 2006). The data analysis consisted of three main phases. Initially, based on the participants' observations during the focus group – the primary data (Fig.1) – by using the NVIVO software, the first-order concepts were extracted as context-specific meanings related to the observers. Then, the second-order themes were identified by the researchers by aggregating the first-order concepts as higher-order themes. Finally, three overarching dimensions were determined from the second-order themes as the main theoretical concepts capable of exploring the research topics. To guarantee the interpretations' acceptability (Langley, 1999), this identification process was accomplished through an interpretive and non-mechanical process of examining the data using the theoretical background of OL and CE as a reference. Iterative discussion among researchers was used to question the interpretations' plausibility (Mantere et al., 2012).

4. Results

The discussions among SME managers revealed three main clusters of barriers that impact the actual and perceived introduction of CBMs in the Italian construction sector, related to external environment, supply chain context, and organizational level. As a transversal element, a fourth element – more specifically, a cultural one – is considered to be embedded in the other three dimensions.

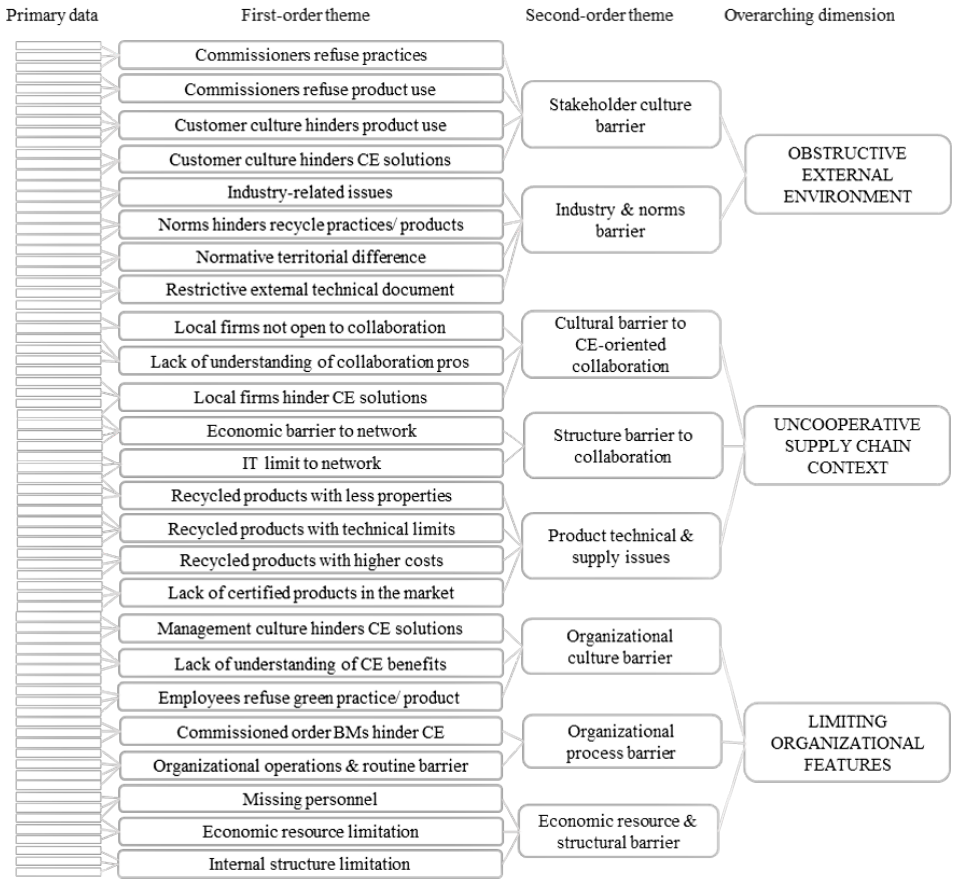
4.1 Obstructive external environment: stakeholders' culture, industry and norms barriers

The analysis provides insight into macro-environment limitations in terms of public laws and regulations, general characteristics of the sector, and stakeholders' propensity towards CE.

First, cultural stakeholders' resistance – mainly identified in customers and commissioners – to circular products and processes hinders the implementation of CBM-oriented OL processes. Customers' lack of acceptance of specific construction-related circular solutions, such as modular buildings or social housing, also hinders the diffusion of specific CBMs. Unlike the citizens of other countries, Italian customers prefer tailor-made solutions and consider "traditional" (i.e., non-modular) houses to be more trustworthy. Similarly, private and public commissioners tend to limit the application of recycled materials and practices when they are not compulsory. This seems to be due to low cultural openness to circular solutions, perhaps due to a limited understanding of the related benefits.

This kind of market [i.e., renting solutions] in Italy is not only a utopia [but also] pure science fiction. It would be impossible to sell it to the Italians. –
Focus group 2, G., private building construction

Figure 1. *Data analysis process: first-order themes, second-order themes, and overarching dimensions.*



Source: Elaborated by the authors (2020)

Second, the actual Italian norms concerning public procurements mandate the introduction of green requirements for materials that must respect a specific percentage of CAM, Italian acronym for "Minimal Environmental Criteria" (European Council directive 2004/18/CE, 2004; GU D.Lgs 19 Aprile 2017 n. 56). However, those requirements are not extended to private commissioners, thus resulting in different approaches towards CE. Concerning public tenders, some contradictory norms hinder the use of specific types of materials. The use of recycled materials and the provision of recycling activities during construction operations need to be prescribed in official technical external documents related to public tenders that report the required materials' precise characteristics. A significant number of technical documents still refer to the 'traditional' list of materials that do

not include innovative and recycled materials. Additionally, construction firms are usually forced to send aggregates to landfills as the only possible recycling activity. Thus, alternative solutions are not allowed, such as the reuse of aggregates extracted in construction sites, which is expected in a circular approach.

Third, the sector's specific characteristics – such as the presence of a significant number of firms working with traditional approaches in some territories – discourage and hinder construction firms from proposing sustainability-oriented innovative solutions.

One thing is that one hundred companies all think and work in a certain way. Another thing is that ten companies work in a certain way, and the other two hundred thousand still work the same as one hundred years ago. – Focus group 3, S., private building constructor

Furthermore, territorially different – or missing – regulations related to specific waste management activities differentiate the possibility of easily recycling materials from construction operations.

In summary, stakeholders' resistance to CE solutions and industry-related issues represent the main barriers to CBM-oriented OL processes at the macro level, thus comprising the first dimension: obstructive external environment.

4.2 Uncooperative supply chain context: cultural and structural barriers to collaboration and product-related issues

As mentioned, collaboration among supply chain actors has been identified as a potential solution to SMEs' resource constraints (Akintoye & Main, 2007), and is required for a complete application of CBMs. This cluster of barriers relates to inter-organizational learning activities inside the building construction supply chains (SCs) for CBMs.

First, strong cultural resistance to collaboration is rooted in specific territorial areas, such as in supply chain organizations in some Northern and Southern Italian regions; this has resulted in a preliminary barrier to CBM application and related OL processes. Additionally, it is seen that the limited propensity to participate in collaborative solutions is connected to a limited understanding of network-related benefits.

Second, some barriers refer to structural limitations to inter-organizational collaboration networks, mainly economic and information-technology (IT) barriers. Financial resources' unavailability to be invested in conjoint activities was highlighted by managers as the main barrier, which is in line with typical limitations of SMEs.

In Piedmont [a Northern Italy region], there is very little collaboration […] It is part of the companies' mindset […] You prefer to keep it [machinery] in the courtyard [rather] than renting it to your competitor. – Focus group 4, M., public-private constructor, quarry extraction

Additionally, collaboration activities related to technical projects need to be carried out through specific sectoral information systems – for example, Building Information Modelling systems (BIM, i.e., a cloud-based information system for projecting, planning, and managing construction projects; Bryde et al., 2013). In this sense, collaboration is obstructed by the often-limited interoperability of IT systems across organizations.

The first reticence I find in those colleagues we try to involve [in the collaboration] is 'how much does it cost me?' without really understanding the benefit […] The involvement of other colleagues is seriously challenging. It is difficult for different reasons. First, economic [ones] […] the network operating cost. – Focus group 3, F., scaffolding projecting and renting

Third, the use of recycled products is hindered by specific issues related to technical and supply-related issues. On the one hand, recycled – or secondary – materials sometimes contain inferior technical properties or aesthetic attributes that make customers prefer the virgin one. On the other hand, the low availability of specific products that offer both an adequate quantity of recycled materials and the required certification (e.g., UNI certification; UNI, 2020) limits secondary materials to specific areas for particular activities. In conclusion, stakeholder cultural barriers, economic and operative restrictions on collaborative solutions, and product-related issues comprise the second dimension of CBM-oriented OL processes barrier: an uncooperative supply chain.

4.3 Limiting organizational features: management, processes, personnel and resource barrier

Several barriers to CBM-oriented OL processes relate to organizational features, particularly organizational culture, processes, organizational resources, and structures.

First, as identified in top management culture, organizational culture (Durst & Wilhelm, 2012) can be a critical barrier to the implementation of CBM-oriented OL processes. Top managers tend to be very conservative concerning construction techniques and materials and generally show a willingness to consider innovative solutions only if they have a personal sensibility towards environmental issues. Another critical obstruction is posed by internal personnel and in particular by responsible figures – such

as site managers and technicians – who refuse to change their ordinary routines. Technicians who have administrative responsibilities for specific processes tend not to trust recycled material if certifications recognized by the law do not discuss them. They fear that recycled materials will not perform as well as virgin ones. Additionally, the daily use of pure material and traditional solutions hinders the implementation of innovative solutions related to CBMs.

T*ell me why a private [constructor] should utilize it [recycled material] […] unless they do not have a very ecological vocation. Otherwise, they do not think about it in the slightest.* – Focus group 1, A, private building constructor

This unwillingness seems to be linked to a limited understanding of available CBMs in the sector and the related economic and organizational benefits. There is little knowledge among construction managers of the practical application of CE principles through innovative BMs, which leads to territorial differences in the application of CBMs across the country. The applicability of CBMs is also hindered by a poor understanding of the economic benefits related to the implementation of CBMs; in fact, CE solutions are typically only considered additional operative costs instead of potential opportunities.

Second, one crucial aspect of organizational processes was highlighted by managers: the applicability of certain CBMs – such as secondary material reuse and circular supply – is strictly limited in work-on-commission companies and commissioners (e.g., suitable materials, operations, and logistic solutions). This situation leaves firms to manage internal operations only under the commissioners' directives. From an operative point of view, the often-hectic organizational routines, which are also related to limited planning activities among construction companies (Sweis et al., 2008), hinder not only involvement in networks but also the consideration of innovative solutions in general. Most attention is given to short-term earnings (Betts et al., 1991) through known solutions.

The moment construction firms win a project […] inevitably, the project has been already commissioned in a certain way, and with related materials, and so […] there is a difficulty linked to the fact that the company needs to attain what is said in the technical document. – Focus group 1, P, private construction and construction material supplier

Third, the economic barriers are particularly relevant at the organizational level for secondary material supplies and collaborative solutions development and for internal competence development processes to be introduced for CE-related solutions. Construction firms are traditionally

characterized by several limitations related to their organizational structure, such as a lack of organizational resources (Blayse & Manley, 2004). The limitations identified – low availability of personnel and lacking economic and physical resources – are aligned with those usually related to SMEs' characteristics (e.g., Barson et al., 2000).

In conclusion, the barriers related to managerial culture, organizational processes, internal staff, and economic resources represent the last dimension: limiting organizational features.

5. Discussion

The identified dimensions – the external environment, the supply chain context, the organization and the embedded cultural elements – encompass the main contextual elements that construction firms need to overcome to implement CBM-oriented OL processes.

At the external environment level, structural barriers do not seem to stimulate the application of some CBMs. Normative restrictions, together with territorial differences concerning waste management regulation, cause discrepancies among CBMs' applicability at the national level, limiting the managers' propensity to consider these kinds of approaches. However, the main hindrance is the insufficient attention given to circular solutions by construction stakeholders, such as customers and commissioners, limiting the macro-level application of CBMs from a cultural point of view.

At the supply chain level, collaboration among SC actors – which is essential for CBM application – is hindered from a resource-related point of view, which underscores the lack of economic, human, and technological resources to dedicate to network activities. There is also a cultural aversion towards cooperation related to specific territories, and a limited understanding of the intrinsic value of collaborative consumption, which seems to be associated with a general cultural disregard for and lack of knowledge of circular-related advantages and, consequently, CBM application.

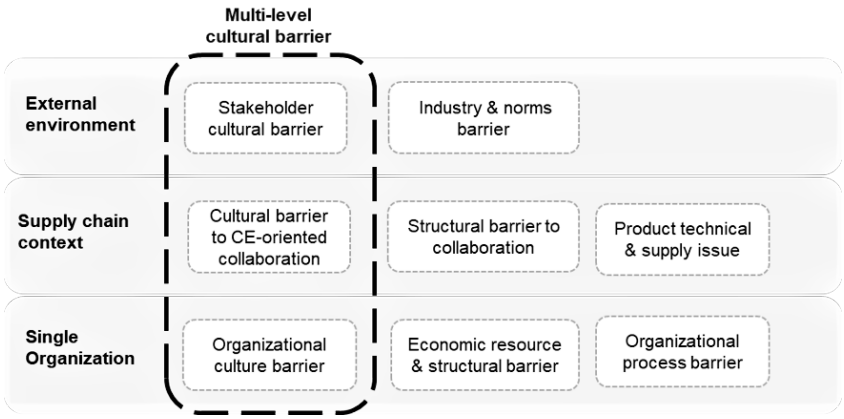
At the organizational level, organizational constraints hinder the application of CBMs among SMEs. Many barriers are strictly related to constraints typical of SMEs (Barson et al., 2000), such as a lack of economic resources invested in specialized competence development or traditional organizational processes. However, the main obstacle is related to internal resources, namely responsible persons and top management. In particular, top managers lack knowledge regarding practical CBM application and display a cultural lack of interest in CE solutions.

Embedded in those three dimensions, a multi-level cultural element emerges as the most critical contextual factor to be managed during CE application in SMEs. As proposed in the theoretical discussion, culture has

mainly been analysed in the OL literature as a critical contextual element of the organizational level (Fiol & Lyles, 1985). It is also generally considered a necessary conduit for achieving an 'ecologically rational society' (Plumwood, 2005:91). Here, the definition of culture as composed of macro, supply chain, and organizational levels expands the understanding of this critical contextual element in particular settings, specifically in CE applications in the construction sector.

Figure 2 presents the theoretical interrelation of results concerning the developed propositions.

Figure 2. CBM-oriented OL contextual elements: the external environment, the supply chain context, organization features, and a transversal multi-level cultural dimension.



Source: Elaborated by the authors (2020)

6. Implications

This study offers some theoretical, political, and managerial implications. From a theoretical point of view, the proposed OL theoretical lens in CE analysis aids in the identification of main contextual factors related to CBM-oriented OL processes, acting as barriers to their implementation. Construction firms seem to require the introduction of intra and inter-organizational OL processes as a preliminary phase in CBM application to understand which specific CE-oriented processes to activate, and related economic advantages (Prop.1). The identification of external, and supply chain-related elements, together with organizational features, and a transversal multi-level cultural dimension able to hinder OL processes activation would enable an enhanced awareness of SME managers on potential barriers to be overcome in the transition towards CE.

Additionally, the paper contributes to the discussion of the application of CBM in a specific context, highlighting multiple dimensions – the macro level, the supply chain, and the organizational level (Prop. 2,3,4) – that are capable of hindering the activation of CBM-oriented OL processes among construction SMEs. In addition, the study contributes to the identification of relevant cultural elements in the external environment as well as in the supply chain and organizational levels; this lays the foundation for individuating a multi-level and transversal cultural barrier for the application of CBM-oriented OL processes (Prop.5).

From a managerial perspective, the study highlights the importance of organizational and inter-organizational elements for sustainable development of the CE. In particular, internal OL processes (e.g., knowledge creation, transfer, and storage between workers and technical managers) and participation in collaborative networks are highlighted as useful for overcoming cultural and structural limitations in applying CBM-oriented OL processes. The OL theory proposes for construction SMEs the activation of transversal processes for the transfer of knowledge through the external environment, supply chains, and organizations (e.g., recourse to consultants, training activities, and sharing of acceptable practices) for a progressive cultural reorientation towards innovative solutions, such as the implementation of CBMs at intraorganizational and interorganizational level. The analysis implies that a broader and better understanding of CE-oriented evolutions' economic benefits, - enabled by OL processes of knowledge creation, transfer, and retention, - should increase acceptance of CE in the Italian construction sector. This implication might be cautiously expanded to other sectors, considering the alignment to previous literature on the relevance of culture in CE applications and technological innovations (e.g., Sanz-Valle et al., 2011).

The paper also has significant policy implications. The activation of creation, transfer, and storage of knowledge in the external environment can support the overall evolution of the CE's Italian construction sector. Macro-level OL processes can help achieve more standard regulations, more circular solutions, and greater awareness of the environmental, technical, and economic benefits of CBMs. From this perspective, the possible links between individual SMEs, supply chains, and the entire sector could be facilitated by corporate representation bodies, such as professional associations. In fact, at a sectoral level, these entities could influence CE solutions' regulatory evolution and represent SMEs' interests, helping them overcome the limitations due to their size. Furthermore, at the inter-organizational level, these bodies could connect actors and spread CE knowledge throughout the sector, facilitating a more comprehensive application of CBM in Italy. These interventions are particularly relevant at this time, considering how the healthcare crisis due to COVID-19 has highlighted the need to relaunch

economies from a CE perspective. Managers have the opportunity to redefine work processes (Sarkis, 2020), such as shortening supply chains and developing a more localized economy to ensure greater entrepreneurial resilience (Panwar et al., 2020; Tseng et al., 2020).

7. Limitations and further research

This study has some limitations. For instance, the choice of a single context of analysis and the focus group methodology could limit the results' generalisability. However, the Italian context is undergoing a phase of significant CE growth, albeit in a preliminary stage (Circular Economy Network & ENEA, 2020); this provides a valuable context for in-depth qualitative research (Yin, 2017). Regarding the focus group methodology and possible subjectivity of the interpretations, the iterative protocol followed for interpretation should limit such bias increasing the study's methodological efficacy (Cassell & Symon, 2004; Freeman, 2006; Morgan, 1997). Furthermore, the inherent subjectivity of qualitative research was accounted for throughout the interpretation and coding process also by using the NVIVO software.

A further consideration concerns the obligation to carry out the focus group sessions virtually due to the restrictions related to the COVID-19 pandemic. This potential limitation can also be seen as an interesting reflection of the virtual methodologies that may be developed in the future (Dodds & Hess, 2020). Based on the results obtained in this study, it would be useful for future research to further examine which activities would prospect an effective implementation of OL processes and CBMs in this sector. Specifically, the identification of enablers of CBM-oriented OL processes would be particularly valuable in light of the possible recovery period following the COVID-19 pandemic period that may lead to a "new normal" (Buheij et al., 2020) characterized by changes in the organizational approaches and activities from SME, together with a transition towards more circular cultural norms of societies. Accordingly, further research could investigate the multi-level cultural element, highlighting the relationships between the different dimensions and their relative influence; it is relevant to underline that the organizational culture – as part of the organizational level – could be significantly influenced by the other cultural elements present in the higher-level dimensions, and thus prospect an interesting avenue for further research on the topic. In addition, the employment of longitudinal studies oriented to test the proposed model in different national contexts rather than Italy, or different Italian sectors should increase the generalizability of the results offering a novel interpretation of the preliminary phases of CBM introduction inside SMEs.

Italian summary: Il presente studio è finalizzato ad esaminare le condizioni organizzative che possono condurre ad una più efficace applicazione dell'Economia Circolare nelle piccole e medie imprese. La ricerca ha portato all'identificazione di barriere che influenzano l'implementazione dei processi di apprendimento relativi ai Business Model Circolari. Attraverso l'approccio teorico della grounded theory e la metodologia del focus group, è stata analizzata la percezione dei top manager delle piccole-medie imprese del settore delle Costruzioni italiano. Muovendo dalla prospettiva offerta dalla letteratura dell'Organizational Learning e quella relativa all'Economia circolare, i dati ottenuti sono stati analizzati tramite una rigorosa tecnica di codifica ed interpretazione iterativa. Lo studio identifica specifiche barriere che spaziano da alcune caratteristiche del settore stesso, delle catene di fornitura, e della singola organizzazione, e sottolinea la rilevanza della variabile culturale che sembra limitare l'applicazione di Business Model Circolari in tutti i livelli di analisi. Lo studio presenta implicazioni teoriche e manageriali sottolineando come i processi di apprendimento siano fondamentali all'applicazione dei Business Model Circolari.

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