Etikonomi
Volume 21 (2), 2022: 313 - 334
P-ISSN: 1412-8969; E-ISSN: 2461-0771

Circular Economy Business Models in the Micro, Small, and Medium Enterprises: A Review

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JEL Classification:
L26
M10
Q56

Received: 08 January 2022

1st Revision: 23 February 2022

2nd Revision: 23 March 2022

Accepted: 29 March 2022

Abstract

MSME business should be built based on circular economy (CE)-based business models. The purpose of this article is to present a review of several articles that have been published in Scopus discussing the CE-based business model and MSMEs to find research gaps and future research agendas. It used some tools of the theoretical assay, such as bibliometric analysis, systematic literature review, theory, context, and characteristic methodology (TCCM). The paper outlines all findings of analyzed literature about CE's business model applied by MSME in the Scopus document until June 2021. The findings of this study provided more high-quality evidence about research and practical gaps regarding the CE-based business model and MSME, which needs more research focuses on market desirability in the future and more understanding of internal processes in MSME's case studies. The implication of this article is to provide a future research agenda based on a collection of research gaps as a basis for empirical research.

Keywords:

business model, micro, small, and medium enterprises, circular economy

How to Cite:

Pangarso, A., Sisilia, K.,& Perangianangin, Y. (2022). Circular Econony Business Models in the Micro, Small, and Medium Enterprises: A Review. *Etikonomi, 21*(2), 313–334. https://doi.org/10.15408/etk.v21i2.24052.

INTRODUCTION

A circular economy (CE) is an economic system with a closed loop from production to consumption based on the 3R (Reduce, Reuse, and Recycle) principle (Kirchherr et al., 2017). CE has become a crucial topic that has been widely researched at the end of this decade. It is a condition for realizing economic, social, and environmental sustainability (Geissdoerfer et al., 2017). CE is also related to new business models to realize sustainable development (Ghisellini et al., 2016).

Micro, small, and medium enterprises (MSMEs) play an important role in the economic progress of a country (Khurana et al., 2021). A common problem faced by MSMEs is related to changes in business models, particularly in responding to the dynamics of the business environment (Ramantoko et al., 2019). A business model is how a business organization creates and delivers value to its stakeholders (Teece, 2010; Zott & Amit, 2010). The dynamic of the business environment that MSMEs are currently facing is the pandemic of the novel coronavirus disease 2019 (COVID-19). It directly impacts the general decline in MSME business conditions (Syaifullah et al., 2021). Note that this pandemic is also related to CE. It is the good momentum for the broad implementation of CE in the business world (Ibn-Mohammed et al., 2021). The COVID-19 pandemic impacts the reduction of carbon emissions that positively affects the environment (Saadat et al., 2020). Entrepreneurs (including MSME business owners) could also have played a role in implementing the CE concept when the COVID-19 pandemic happened (Neumeyer et al., 2020). Therefore, the COVID-19 pandemic is also part of the background for the need of research on CE-based business models for MSMEs. According to the Organization of Economic Co-operation and Development, the main difference between SMEs and MSMEs is the number of workers. MSMEs are categorized as the smallest businesses with a few workers between 5 and 10 people. Gatto & Re (2021) and Cantú et al. (2021) published systematic literature review (SLR) CE-based business models for bioproduct enabler–barriers for the implementation of CE business models of SMEs in developing countries. However, this research is not for MSMEs. The circular economy has three levels: macro, meso, and micro. The macro level focuses on cities, regions, and nations. The meso level focuses on eco-industrial parks (Ghisellini. et al., 2016; Kirchherr et al., 2017; Prieto-Sandoval et al., 2018). Businesses run by SMEs are increasingly concerned about sustainability, as shown by several studies. SMEs are increasingly concerned with environmental protection so they try to carry out sustainable practices (Yadav et al., 2018), SMEs can gain financial positives through sustainability-related factors (Burlea-Schiopoiu & Mihai, 2019) such as innovation, training, and corporate social responsibility. In terms of stakeholder engagement, governmental policies also encourage SMEs to be more active in carrying out sustainable development business actions (Medina-Muoz & Medina-Muoz, 2000). The topic of sustainability in SMEs using circular economy business models is still rare, thus academics plan to solve the research and practical gaps from Scopus until June 2021. From now on, CE issues and business models will be scrutinized further. It is now being attacked for hurting

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DOI: https://doi.org/10.15408/etk.v21i2.24052

ecosystem and society (Sauvé et al., 2016). In addition, CE is also said to achieve the UN's Sustainable Development goals, supporting the improvement of essential areas for planet earth and humanity. As a result, industry, particularly SMEs, will be under more pressure to adopt CE (also MSMEs). This includes the Circular Economic Action Plan 2015, which identifies 54 activities to achieve a carbon-neutral, resource-efficient, and competitive economy. Sitra, The Finnish Innovation Fund, created a repository containing 100 case studies describing how various Finnish companies are transitioning to incorporate the CE concept in their business models, including the SME business.

A literature review is the initial stage in creating a CE-based MSME business model. The literature review will yield results, data, and information relevant to scientific research on the CE-based business model in MSMEs. A literature review may reveal a research deficit. Existing research gaps inform future research goals, which may include CE-based business models for MSMEs. Geissdoerfer et al. (2017) stated that further research on CE-based business models is still needed. A thorough study agenda based on a collection of research gaps by Theory, Context, Characteristics, and Methodology (TCCM) has not been published as far as the authors are aware as of June 2021. This research gap informs the current study. Still little research on MSMEs' CE. As far as the authors are aware, from the Scopus indexed documents up to June 2021, Singh et al. (2018) examined the readiness of MSMEs in only India to implement the CE concept. Indexed scientific research publications, especially Scopus, belong to a reputable category, other than Web of Science (WoS) (Gatto & Re, 2021; Kirillova, 2017).

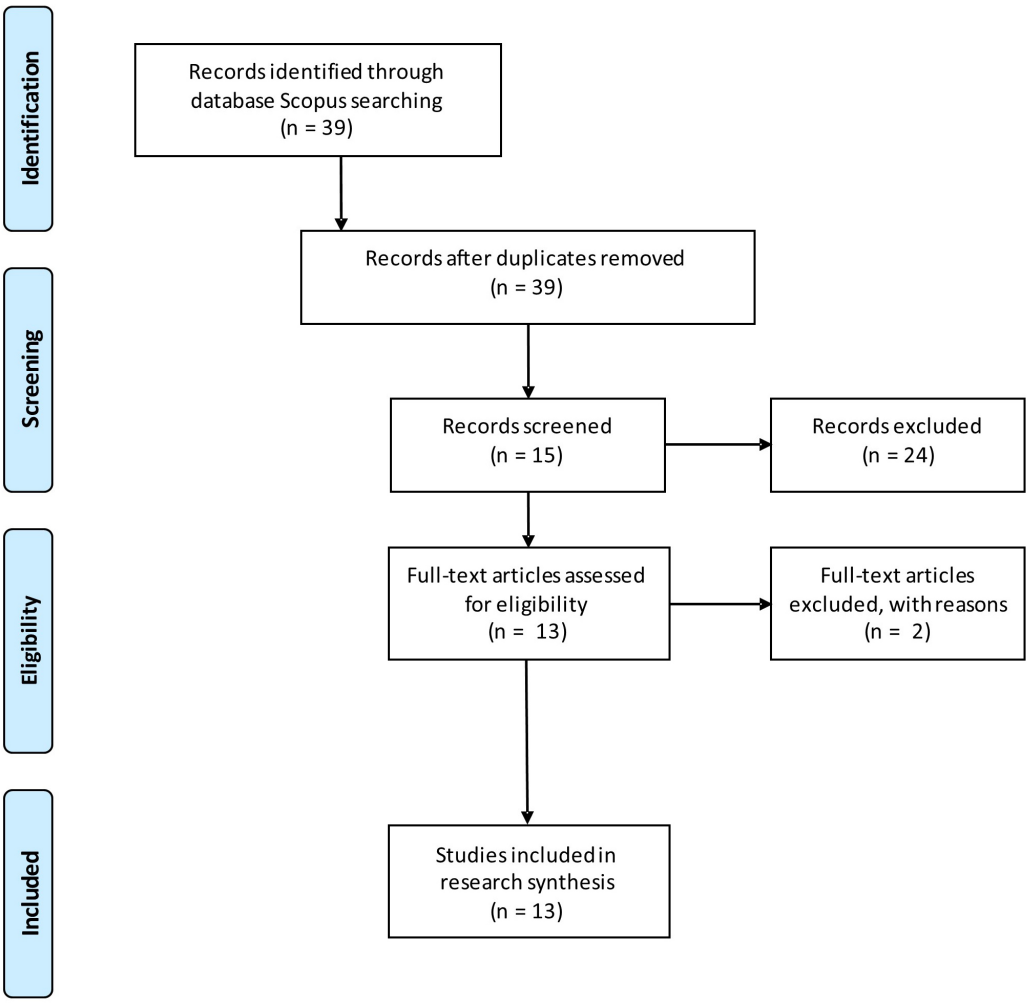
Scopus is a good source for quality scientific articles and professors. Rarely do we hear about CE, business models, or SMEs. The CE technique is now being developed in industry; scholarly literature is still in its infancy. It is argued that several barriers limit the transition of CE in business, and one of them is the absence of CE business model knowledge (Garcés-Ayerbe et al., 2019). This obstacle is even more significant for SMEs because SMEs have limited capacity and resources, thereby reducing their ability to overcome them (Álvarez et al., 2019; Wang. 2016). Access to information and gaps in barriers to CE business models at the micro-level, specifically in SMEs, will be an important reference for stakeholders. Using the SLR procedure, this research seeks to understand impediments, drivers, motivations, and best practices across CE business models at the SME level globally.

So, this study asks, "What are the research gaps and future research goals found in Scopus indexed documents about CE-based business models for MSMEs?" This study adds to the body of information concerning entrepreneurship in the context of MSME. With the help of TCCM analysis, it contributes to the development of CE-based business models. It also provides a solid foundation for more in-depth empirical research on CE-based business models for MSMEs.

METHODS

This study is uses the SLR method (Paul & Criado, 2020; Snyder, 2019). This study's data are secondary. Until June 2021, the document database utilized to acquire relevant literature is Scopus. The Scopus database was chosen as an alternative to WoS for authors to search. The research approach uses three sequences to address the research question: bibliometric analysis, SLR, and TCCM. The bibliometric analysis initiates SLR and aims to provide a scientific overview of previous research on CE-based business models for MSMEs. Bibliometric analysis uses the VOSviewer a user-friendly software program (van Eck & Waltman, 2010).

Figure 1. Systematic Literature Review Process



Source: Moher et al. (2009)

SLR is an integrative or systematic literature review used as a strategy to build literature review articles. SLR has the advantage of a structured review process, and is as transparent, replicable, and exhaustive as possible (Torraco, 2005). A SLR starts by arguing for a literature review and assessing the issue or problem to be studied. Then a body of material is picked and reviewed, sifted to ensure strengths and weaknesses,

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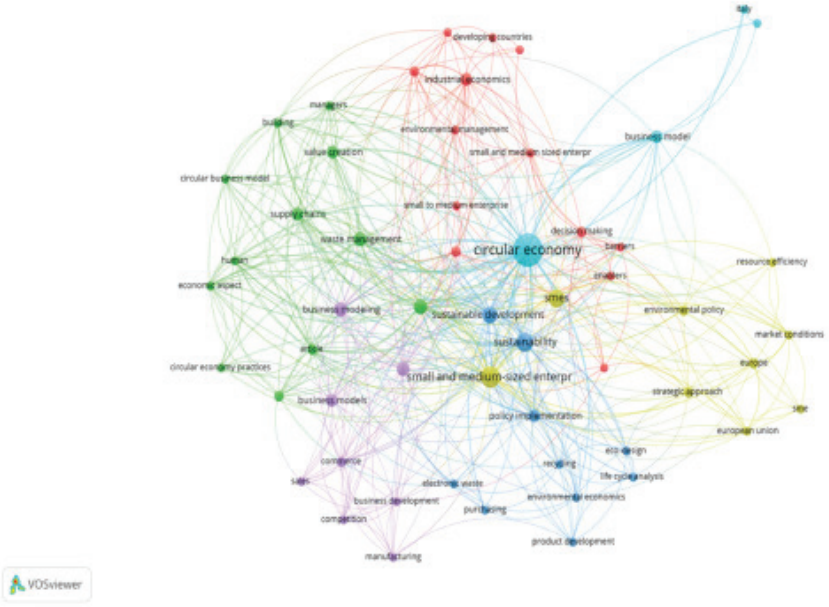
and then old and new ideas are merged to provide new formulations of topics or issues (Torraco, 2005). The SLR generates a new framework and perspective from an integrated review, critique and synthesis of literature on a topic (Torraco, 2005). For Kitchenham et al. (2009) SLR is a literature survey with defined research questions, a clear search and extraction process for data and presentation. SLR is concerned with finding, assessing and synthesizing evidence (Petticrew & Roberts, 2006) whose process requires a range of techniques to minimize bias and error so as to provide 'high quality' evidence. The SLR process with PRISMA guidelines produces scientific publication documents from the Scopus database for the CE business models for MSMEs worthy of further analysis (Liberati et al., 2009; Moher et al., 2009). Figure 1 depicts the PRISMA SLR procedure. Identification, screening, eligibility, and inclusion are all part of SLR. The search term package "business model" AND "circular economy" AND "small medium enterprise" OR "SME" OR "micro small medium enterprise" OR "MSME" identified 39 scientific research published documents indexed by Scopus until June 2021. During the screening stage, no duplicate research publications are found. For each document, the phrases "business model", "circular economy", and "SME/MSME" should be excluded from the title, abstract, and keywords. Twenty-four documents lack the phrases "business model," "circular economy," and "SME/MSME" in the title, abstract, or keywords. In the eligibility stage, 13 documents passed the screening and can be downloaded in full by the authors. Finally, the authors must download 13 papers for TCCM analysis. Pangarso et al. (2022) states that a literature review can be carried out with a literature count of less than 50.

The search also uses the phrase "small medium enterprise" (SME) with the consideration that SME is part of MSME and because there is only one previous research document (Palacio et al. 2021)) if the acronym "SME" is excluded in the search keywords. A Scopus search for the keywords "SME" OR "small medium enterprise" with business science subjects in English yields 15,495 documents from 1,949. For business science subjects in English, the Scopus indexed document search shows a total of 282 documents from 2003. The authors hypothesize that SME is the progenitor of MSME based on keyword searches in the Scopus database. It also underpins the term "SME" used in research data collecting.. Meanwhile, the analysis of SLR documents uses the TCCM framework (Pérez-Pérez et al., 2020). TCCM is a structured review domain-based framework, which aims to find research gaps and provide suggestions for future research agendas on the basis of the SLR documents.

RESULTS AND DISCUSSION

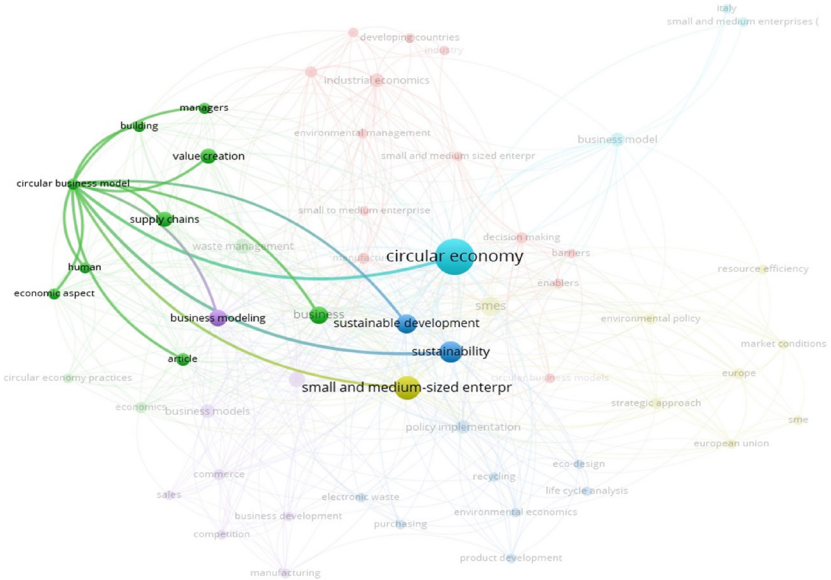
In Figure 2, Scopus indexed research publications for the keywords "business model" AND "circular economy" AND "small medium enterprise" OR "SME" OR "micro small medium enterprise" OR "MSME." VOSviewer employs co-occurrence analysis with a minimum of two keywords. The authors use co-occurrences to show how VOSviewer findings can indicate business model components and subjects.

Figure 2. Results of Data Processing Using VOSviewer for Scopus indexed Research Publications



As shown in Figure 2, six clusters group 58 topics related to the CE business models for SMEs/MSMEs based on color (green consists of 12 topics; purple comprises eight topics; blue consists of 10 topics; red comprises 13 topics; turquoise consists of six topics; yellow comprises nine topics). From Figure 5 for the largest circle, the CE topic is in the middle of the turquoise color. Of the total 58 topics, three topics are explicitly about circular business models (green, purple, and turquoise clusters). Figures 3a, 3b, and 3c below show specifically the three explicit clusters of business models.

Figure 3a. Processing Results of the VOSviewer Circular Business Model (Green Cluster)



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DOI: https://doi.org/10.15408/etk.v21i2.24052

Figure 3b. Processing Results of the VOSviewer Circular Business Model (Purple Cluster)

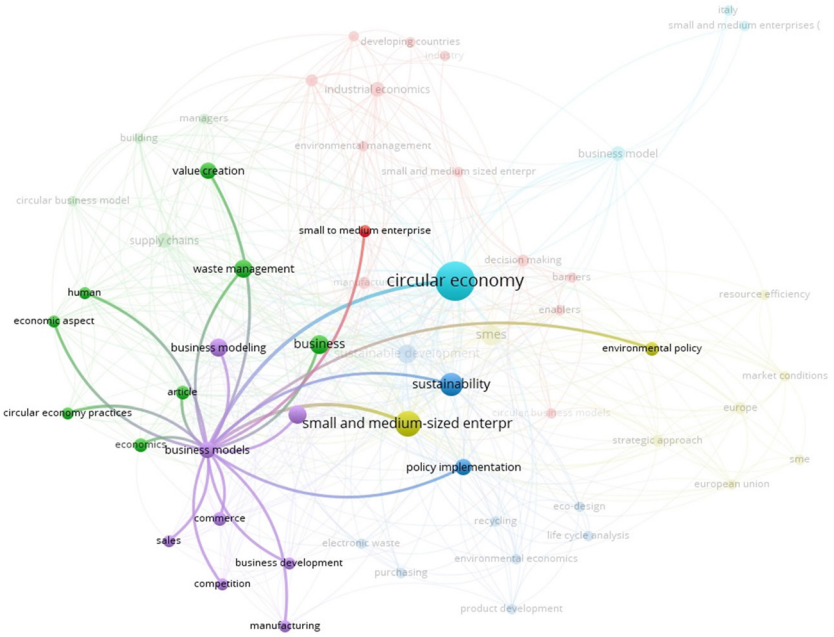
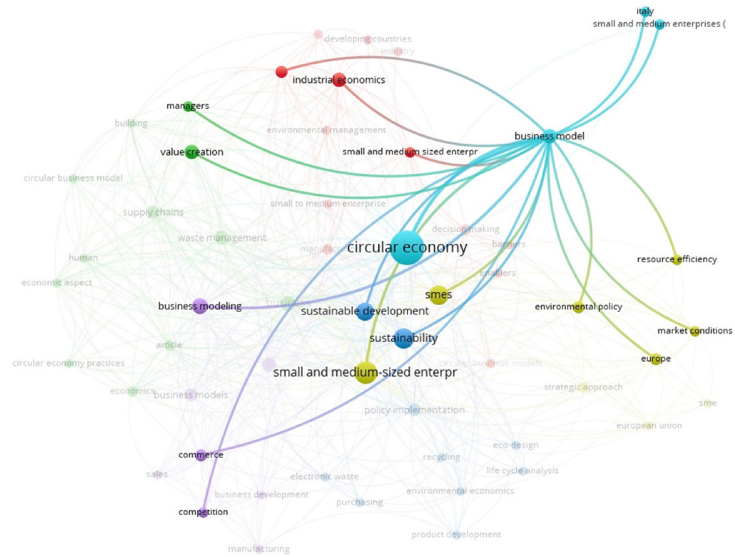


Figure 3c. Processing Results of the VOSviewer Circular Business Model (Turquoise Cluster)



The comparison of the processing results of the VOSviewer circular business model for the green, purple, and turquoise clusters can be seen in Table 1. Based on Scopus VOSviewer software, bibliometric results for the keywords "business model" and "circular economy" was found. VOSviewer uses co-occurrence analysis when a keyword appears twice. This method is used to see how VOSviewer results connect to business model constructs and topics.

Table 2 presents 13 papers for detailed analysis, as well as information on the journal's origin and quality. The leading SLR assessed 13 papers from major worldwide

publishers whose journals are indexed by Scopus Q1 and WoS with impact factor (SSCI and/or SCIE). The documents analyzed met these criteria with flying colors. Documents with more citations in the Scopus database are discussed first. Table 3 shows the TCCM framework analysis of the 13 publications.

Table 1. Comparison among the results of processing the VOSviewer circular business model for green, purple, and turquoise clusters

No.	Green clusters associated with		Purple clusters associated with		Turquoise clusters associated with	
	Topic	Cluster	Topic	Cluster	Topic	Cluster
1	Buildings	Green	Waste management	Green	**Value creation**	Green
2	Manager		CE practices		Manager	
3	**Value creation**		**Value creation**		**Sustainability**	Blue
4	Supply chains		Economics		Sustainable development	
5	Business		Business		**Business modeling**	
6	Human		Human		Commerce	Purple
7	Economic aspect		Economic aspect		Competition	
8	Article		Article		**SMEs**	Yellow
9	**Sustainability**	Blue	**Sustainability**	Blue	Environmental policy	
10	Sustainable development		Policy implementation		SME	
11	**Business modeling**	Purple	**Business modeling**		Resource efficiency	
12	**SME**	Yellow	SME		Market conditions	
13	**CE**	Turquoise	Commerce		Europe	
14			Sales	Purple	**CE**	
15			Business development		Italy	Turquoise
16			Competition		SME	
17			Manufacturing		Industrial economics	Red
18			**SME**	Yellow	SME	
19			Environmental policy			
20			**CE**	Turquoise		
21			SME	Red		

In terms of theory, the theories/concepts used are: First, general system theory, which is related to CE. CE is a system that is a requirement to achieve sustainability (Bertalanffy, 1950). Second, ReSOLVE framework comprising five important dimensions related to CE, namely, regenerate, share, optimize, loop, virtualize, and exchange. Third, Pecking order theory, which is related to SME financing that is associated with CE-based business models. Fourth, organizational learning/OL that plays a role in implementing a CE-based business model for SMEs, interorganizational and intraorganizational (Argote, 2000). Fifth,

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innovation diamond model, which consists of strategy, organization, process procedure, linkage, and learning related to the capacity of SMEs in an organization to implement a CE-based business model (Tidd et al., 2005). The theory-related gaps in the research on CE-based business models for SMEs: (1) are community-based and can become a future research agenda using social learning theory (Rizos et al., 2016); (2) use the SWIT framework, so that it can become a future research agenda (Cantú et al., 2021).

Three key research contexts exist: location (region/country), sector/industry, and analysis level. Europe and the Americas remain dominant research locations (US). These are mostly developed nations. Only one researcher has explored CE-based business models for emerging economies by Cantú et al. (2021) in Mexico. This relates to Figure 3. Almost every industry has been included in the CE-based business models for SMEs research. Because business models offer a holistic perspective of business organizations, the relevant analysis level is organizational. Context-related gaps in studies by Ünal et al. (2019), Horvath et al. (2019), Ceptureanu et al. (2018), and Scipioni et al. (2021) are still limited in research context, especially in locations outside Europe and the US. Research can be conducted in developing countries, particularly in the Asia and Africa regions. Particular attention should be paid to the Asian region with the most significant test number globally.

Table 2. Journal information for 13 systematic literature review documents

No.	Author/s	Journal name	Publisher	Scopus Quartile by scimagojr.com year 2020	WoS Index (SCIE and SSCI show journals with impact factor)
1	Rizos et al. (2016)	*Sustainability*	MDPI	Q1	SCIE & SSCI
2	Ünal, Urbinati, and Chiaroni (2019)	*Journal of Manufacturing Technology Management*	Emerald	Q1	SCIE & SSCI
3	Ünal et al. (2019)	*Resources, Conservation, and Recycling*	Elsevier	Q1	SCIE
4	Horvath et al. (2019)	*Journal of Business Economics and Management*	Vilnius Gediminas Technical University	Q2	SSCI
5	Ghisetti and Montresor (2020)	*Journal of Evolutionary Economics*	Springer	Q1	SSCI
6	Ceptureanu et al. (2018)	*Amfiteatru Economic*	Editura ASE Bucuresti	Q2	SSCI
7	Hussain et al. (2020)	*Journal of Enterprise Information Management*	Emerald	Q1	SSCI
8	Gatto and Re (2021)	*Sustainability*	MDPI	Q1	SCIE & SSCI
9	Scipioni et al. (2021)	*Sustainability*	MDPI	Q1	SCIE & SSCI
10	Cantú et al. (2021)	*Sustainability*	MDPI	Q1	SCIE & SSCI
11	Dagevos and de Lauwere (2021)	*Sustainability*	MDPI	Q1	SCIE & SSCI
12	Pizzi et al. (2021)	*Management of Environmental Quality*	Emerald	Q2	ESCI
13	Vihma and Moora (2020)	*Environmental and Climate Technologies*	Walter de Gruyter GmbH	Q3	ESCI

Table 3. Systematic literature review document grouping with theory–context–characteristic–methodology framework

No.	Author/s	TCCM framework									Research limitation	Further research recommendation
		Theory and/or Concept discussed	Context			Characteristic	Methodology					
			Research location	Sector and/or Industry	Analysis level		Conceptual	Empirical				
								Qualitative	Quantitative	Mixed method		
1	Rizos et al. (2016)	-	Europe	• Manufacturing • Information and communication • Wholesale and retail • Electricity, gas, steam, and air conditioning supply • Accommodation and food service activities • Transportation and storage • Administrative support • Arts, entertainment, recreation • Human health and social work activities	Organization	Barriers and enablers experienced by SMEs when implementing a CE-based business model	-	Case study	-	-	Did not research enablers specifically	Develop a robust design for community-based SMEs (whatever it takes to build capacity) on the basis of community learning theory
2	Ünal, Urbinati, and Chiaroni (2019)	System theory	Italy	Office supply	Organization	• Value network • Customer value proposition and interface • Managerial commitment	-	Case study with semi-structural interview	-	-	Investigated only one SME in a country	• Test multiple management practice configurations for the research framework • How SMEs can apply CE practices to create and capture value • How SMEs combine scarce resources with CE-related managerial capabilities

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No.	Author/s	TCCM framework									Research limitation	Further research recommendation
		Theory and/or Concept discussed	Context			Characteristic	Methodology					
			Research location	Sector and/or Industry	Analysis level		Conceptual	Empirical				
								Qualitative	Quantitative	Mixed method		
3	Ünal et al. (2019)	System theory	US	Building	Organization	Managerial practices and contexts (internal and external) as a sequence of value creation antecedents	-	Case study (grounded theory by semi-structured interview)	-	-	Focused only on biological materials related to the research context	Discuss material technology and the potential for research with a similar theoretical framework and quantitative testing for a broader and different context
4	Horvath et al. (2019)	Regenerate, share, optimize, loop, virtualize, exchange (ReSOLVE) framework	Belgium	Pharmaceutical biotech	Multiorganization	• Closed business model • Regular open business model • Data-driven business model	√	-	-	-	-	Research on different sectors/ industries
5	Ghisetti and Montresor (2020)	Pecking order theory	Europe	-	Multiorganization	• Circular innovation modes • Circular use modes • Circular output modes	-	-	Econometric	-	Did not examine the separate sources of CE financing between public and private funding	Investigate the risks of various types of financing related to CE-based business models
6	Ceptureanu et al. (2018)	ReSOLVE framework	Romania	PVC	Multiorganization	Value creation	-	-	Correlation	-	Limited only to the PVC industry sector, and the sample is small.	Research on different industrial sectors and with larger sample sizes

No.	Author/s	TCCM framework									Research limitation	Further research recommendation
		Theory and/ or Concept discussed	Context			Characteristic	Methodology					
			Research location	Sector and/or Industry	Analysis level		Conceptual	Empirical				
								Qualitative	Quantitative	Mixed method		
7	Hussain et al. (2020)	-	UK	Food waste	Organization	Waste to energy technology innovation barrier and risk	-	Semi-structured interview	-	-	Limited only to the energy sector	Examine the reuse of liquid waste
8	Gatto and Re (2021)	-	European Union	Bio-based products	-	Circular bio-economy business model	-	SLR	-	-	The potential author subjectivity related to the bibliometric classification of the number of projects analyzed is limited.	Research on CE-based business models that are oriented to market demand
9	Scipioni et al. (2021)	Organizational learning (OL)	Italy	Construction	Multiorganization	Multistage process (internal organization, supply chain stakeholders, external stakeholders) OL (creation, transfer, retention) from culture, regulation, structure, and process	-	-	-	√		

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No.	Author/s	TCCM framework									Research limitation	Further research recommendation
		Theory and/or Concept discussed	Context			Characteristic	Methodology					
			Research location	Sector and/or Industry	Analysis level		Conceptual	Empirical				
								Qualitative	Quantitative	Mixed method		
10	Cantú et al. (2021)	ReSOLVE framework	Mexico	-	Multiorganization	Emerging economy	-	Hybrid-thematic analysis (SLR) and grounded theory (semi-structured interview).	-	-	CE viewpoint using only the ReSOLVE framework.	Use another framework approach (SWIT framework)
11	Dagevos and de Lauwere (2021)	-	The Netherlands	Agriculture	Multiorganization	Critical performance indicators of circular agriculture	-	Interview	-	-	-	-
12	Pizzi et al. (2021)	-	Italy	Digital platform	Organization	Entrepreneurial ecosystem	-	Case study	-	-	The research context is only from one case.	Study the roles of digitization and sustainable behavior; use a broader sample
13	Vihma and Moora (2020)	Innovation Diamond model	Estonia	Manufacturing	Multiorganization	Capacity to implement CE-based business models	-	-	-	Survey and in-depth semi-structured group interviews	-	-

Aside from CE-based business models, value generation, CE-based business model finance, and business model canvas preparation, barriers and facilitators are the most mentioned research aspects. The barriers and enablers of CE-based business models have been studied previously. Rizos et al. (2016) who revealed two main barriers to the existence of a CE-based business model, namely, the lack of support from business networks related to supply and demand and the lack of capital to run a CE-based business model. There must also be a network of local SMEs that have implemented a CE-based business model and a customer perception that the business being operated is "green." Vihma & Moora (2020) stated that relevant strategy, leadership, learning ability, and combining external knowledge and collaboration with various related parties contribute to the successful implementation of a CE-based business model. Ghisetti & Montresor (2020) examined the extent to which financing options are related to implementing a CE-based business model. Self-financing, debt financing, and public funds have proven to be the causes of the practice of CE-based business models from a financial perspective in general in SMEs. Scipioni et al. (2021) argued that the critical factors of a CE-based business model for the MSME construction sector in Italy are external stakeholders, supply chain stakeholders, and organizational culture. In addition, barriers to and enablers for OL processes related to the CE-based business model from a knowledge perspective (creation, transfer, and retention) are found. Cantú et al. (2021) stated theoretical and empirical barriers to SMEs to implement a CE business model in the current economic era. Barriers have two types, namely, internal and external. The research by Cantú et al. (2021) fully demonstrates the barriers to and enablers for implementing a CE-based business model compared with other studies. Pizzi et al. (2021) stated that digital platforms play as enablers in the entrepreneurial ecosystem relationship and as enablers of a CE-based business model for SMEs. The six studies related to the barriers to and enablers for the implementation of a CE-based business model are presented in Table 4.

MSMEs who have financial limitations are very concerned about profits and costs, so they tend to choose to implement cheap and simple green practices. The innovations in MSME that they do incrementally in resource loops will consider profits, costs, knowledge, experts, supply, and demand-side; and externally requires government supports such as regulations, standards, and infrastructure; as listed in table 4. Only Scipioni et al. (2021) gives rise to a user behavior/market context, while others focus heavily on the operational parts of the business model. Research by Bocken & Geradts (2022), through interviews with 200 managers of leading corporations related to sustainability, found three critical things: market desirability, technical feasibility, and business viability. The topic of market desirability or market/demand-side, which is still very rarely studied, will be a perfect research topic gap to do. Business model designs that adopt CE by MSME must also prioritize better serving customer needs in their CE innovations. At the same time, this is a novelty in the literature research of this study. Table 4 also shows that the most widely used method is the case study, so the method used in this study is SLR and TCCM is another novelty.

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Table 4. Summary of Barriers to and Enablers for the Implementation of a CE-based Business Model Based on Previous Research

No.	Author	Barrier	Enabler
1	Rizos et al. (2016)	Lack of support from supply and demand networks Lack of capital Lack of government support Administrative burden Lack of technical know-how Lack of information Other barriers Company environmental culture	Company environmental culture Networking Support from the demand network Financially attractive Recognition Personal knowledge Government support -
2	Vihma and Moora (2020)	-	Relevant strategy and planning Network integration Learning process Owner and manager leadership
3	Ghisetti and Montresor (2020)	Inadequacy of standard financial sources Lack of expertise to implement activities Complex administrative or legal procedures Cost of meeting regulations or standards Difficulty in accessing finance	Self-financing Debt financing Public fund -
4	Scipioni et al. (2021)	External stakeholders (culture and regulations) are mediated by associations to supply chain stakeholders (culture, structure, and process) by alliances and networks, and finally join the internal SME organization (also related to culture, structure, and process).	From the inside out, OL as an enabler starts with internal SME organization (culture, structure, and process), then with supply chain stakeholders (culture, structure, and process), and ultimately with external stakeholders (associations) (related to culture and regulation).
5	Cantú et al. (2021)	External barriers: 1. User behavior (budget, preference, and demand; understanding and perception) 2. Regulatory (implementation, incentives, political landscape, promotion and awareness, regulation) 3. Infrastructure (infrastructure irregularity, technology) 4. Economy and competitive markets (capital and funding, market competition, market trend) 5. Supply Chain (availability, cooperation, logistics)	External enablers 1. Regulatory (implementation, incentives, promotion and awareness, regulation) 2. Infrastructure (available infrastructure, technology) 3. Economy and competitive markets (capital and funding, market competition) 4. Supply chain (leadership, cooperation, incentives to suppliers, logistics)
		Internal barriers: 1. Knowledge (communication, information access and awareness, information on CE) 2. Financial (investment cost, revenue model, cost structure, and risk) 3. Organizational (corporate governance, culture, management, organizational capabilities, organizational resources, strategies) 4. Product and material characteristics (design)	External enablers: 1. Knowledge (communication, information access and awareness, information on CE) 2. Financial (financial support, risk) 3. Organizational (corporate governance, culture, management, organizational capabilities, organizational resources) 4. Product and material characteristics (design)
6	Pizzi et al. (2021)	Technical, cultural, financial	Digital platforms are accelerators of CE-based business models for SMEs.

For the second research characteristic, the framework on value creation antecedents in a CE-based business model has been studied by Ünal et al. (2019). Value network, customer value proposition, interface, and managerial commitment are parts of the CE-based business model for value creation. Furthermore, Ünal et al. (2019) reconstructed a theoretical framework on the antecedents of value creation for a CE-based business model in the SME sector building. The antecedents sequentially include contextual factors (internal: strategy orientation; dynamic managerial capability; experimentation or research and development; company size) and (external: local waste and local use; intellectual rights protection; supplier specification) and managerial practices. Ceptureanu et al. (2018) found a relationship among the three parts of the ReSOLVE framework (regenerate, optimize, and exchange) on the value creation of a CE-based business model.

The characteristics of the third research are categorized as applications. Horvath et al. (2019) described the changes in the business model of the biotech sector in Belgium, starting from closed, regularly open to data-driven. Each type of business model is first analyzed on the basis of the CE concept, namely, the ReSOLVE framework. Then, a business model canvas is formed for a biotech, pharmaceutical company in Belgium. Hussain et al. (2020) explained SMEs' role with a CE-based business model in converting waste into clean energy with technological innovations in the UK. Furthermore, Dagevos & de Lauwere (2021) described the circular agriculture practices for farmers in the Netherlands. The measure of circular agriculture practice uses critical performance indicators of circular agriculture. The perception of farmers as representatives of SMEs toward circular agriculture is an alternative or adaptation. Gatto & Re (2021) reviewed previous studies on a circular bio-economy-based business model in general and showed that the bio-economy business model successfully uses the "technology push and market pull" strategies. Future research based on Gatto and Re (2021) is needed, especially that related to a CE-based business model oriented toward market demand.

The research gap in Ünal et al. (2019) is related to characteristics such as the limited scope of the research and the viewpoint that tends to be from the supply side, rather than the demand side. Therefore, conducting further research with a demand-side viewpoint is suggested. Another research gap in Ünal et al. (2019) is that it tends to focus on the characteristics of biological materials and excludes elements of material technology. Thus, future studies can consider the aspects of material technology. The research gap in Ghisetti & Montresor (2020) lies in characteristics such as the risk of each form of financing related to the practice of a CE-based business model that has not been investigated, thereby opening up future research opportunities for this topic. The research gap in Hussain et al. (2020) is related to the characteristics of liquid waste that have not been explicitly studied. The future research agenda is to investigate the reuse of liquid waste for determining if it cannot only reduce waste but also improve business efficiency. Pizzi et al. (2021) stated that future research is needed regarding the characteristics of digitization and sustainable behavior.

The research is grouped into two major types in terms of methodology, namely, conceptual and empirical research. Only one conceptual research is found. Meanwhile, the

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empirical research comprises eight qualitative, two quantitative, and two mixed-method studies. Research on the CE-based business model for dominant SMEs is qualitative and thus conducts interviews for a specific context. This factor opens additional opportunities for quantitative and mixed-method studies. No quantitative research has used the structural equation modeling (SEM) method to test a theory/model associated with a CE-based business model in an SME/MSME. The study conducted by Ünal et al. (2019) is limited in scope, as it investigates only one SME. A future research plan is needed to examine the influence among constructs on the theoretical framework quantitatively. The research agenda of Ünal et al. (2019) is to develop and empirically test a CE-based business model by using qualitative and/or quantitative methods. The research gap in Ceptureanu et al. (2018) is methodological. Therefore, similar future studies are needed to investigate larger sample sizes. The gap in Gatto & Re (2021) is also methodological, namely, the author subjectivity regarding bibliometric classification and the limited number of projects analyzed. Hence, future research opportunities are open for a more objective bibliometric category and a larger number of projects. Similarly, the gap in Pizzi et al. (2021) is found in its methodology that is limited to only one case. Future studies are needed for broader samples. The future research agenda of Scipioni et al. (2021) is related to the methodology of the theoretical model of multistage OL for the implementation of a CE business model (OL plays an important role in the multistage process for SMEs to implement the CE-based business model).

This study contributes to the previous research gap in Geissdoerfer et al. (2017) and complements the SLR results of previous studies (Gatto & Re, 2021; Cantú et al., 2021) by presenting research gaps and future research agendas on the basis of a complete SLR from the latest and quality data sources. As far as the authors are aware, this is the first study to use bibliometric analysis, SLR and TCCM that provided more high-quality evidence about research, and practical gaps regarding the CE-based business model and MSME (novelty). This study has some limitations. First, the source of the secondary data used for bibliometric and SLR analyses is from the Scopus indexed research publication document database only. The authors have limited access to WoS indexed research publication documents. Future research can conduct the same investigation with WoS databases. Second is the use of secondary data search keyword packages: "business model" AND "circular economy" AND "small medium enterprise" OR "SME" OR "micro small medium enterprise" OR "MSME." Future studies can use a complete keyword package. Last, the results and analyses are still based on previous studies from the SME context, not from the MSME context. Future qualitative research can develop theoretical frameworks in various sectors/industries specifically for MSMEs/SMEs.

CONCLUSION

The results of this study succeeded in answering the research question, namely by finding the research gaps and future research agendas found in Scopus indexed documents up to June 2021 about CE-based business models for MSMEs based on SLR and TCCM. Considering the research gaps, the authors suggest a summary of

future research agendas. Quantitative empirical research using the variant-based SEM method is needed to build, test, and analyze a theoretical framework regarding value creation based on the SWIT framework and social learning theory combined with implementation enablers. A CE-based business model can be constructed for developing countries, especially in Asia, for community-based MSMEs/SMMEs from various sectors/industries with organizational analysis units and a representative number of research samples (large enough for generalization). Variance-based SEM or partial least squares (PLS-SEM) is a quantitative research data processor that has been widely used in top-tier research publications and can be helpful for confirmation and explanation/prediction of a research framework. Empirical testing in the future is essential because the results, especially for significant effects, form the basis for MSME/SME entrepreneurs to pay further attention.

The results of this study are the basis for carrying out further research related to the findings of research gaps. This research has collected various research gaps, making it easier for other researchers to conduct further research based on the research gaps that have been collected. This research has implications for future research agendas.

ACKNOWLEDGEMENT

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