

# Sustainable business models in small and medium-sized enterprises: State of the art and future research directions

Binayak Malla, Michał Zdziarski

## ABSTRACT

**Objective:** This research aims to reveal a conceptual structure of current literature related to sustainable business models (SBMs) with reference to small and medium-sized enterprises (SMEs).

**Research Design & Methods:** We applied methods of bibliometric literature review to identify the most important topics and trends on sustainable business model (SBM) related to SMEs and discuss potential future research directions. Our dataset is built on bibliographic records from two important academic databases: Scopus and the Web of Science. We applied methods of social network analysis using the 'biblioshiny' package in the R environment.

**Findings:** Our review shows that the recent literature on SMEs has a more direct linkage with the circular economy and its related constructs such as circular business model and innovation. The thematic evolution of business models in an entrepreneurial context shows an increasing interest in researchers of sustainable business models and circular economy.

**Implications & Recommendations:** The findings of this research provide valuable guidance and a way forward for future researchers to pursue research on topics related to SBM for SMEs. An extensive literature review conducted using scientific bibliometric methods can serve as a reference to developing a better understanding of how the field of SBM and SME literature has evolved in recent times.

**Contribution & Value Added:** This article is the first of its kind to use bibliometric data analysis tools and techniques to generate pictorial output that highlights the current situation in SBM and SME literature. The study revealed that most of the literature on the given topic is grounded in the European context, with a relatively small body of research conducted thus far in South-East Asian, African, Chinese, and American contexts.

**Article type:** research article

**Keywords:** sustainable business models; circular economy; small and medium-sized enterprises; entrepreneurship; bibliometric review

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## INTRODUCTION

This article aims to identify the conceptual structure of literature relating sustainable business models (SBMs) in the context of small and medium enterprises (SMEs) and propose key directions for further research. Businesses increasingly tend to frame the fundamental logic of a company as a business model (BM) (Belyaeva *et al.*, 2020; Osterwalder & Pigneur, 2010; Teece, 2010). The BM defines how a company creates, delivers, and captures value to generate profitable revenue streams to achieve competitive advantage (Dubosson-Torbay *et al.*, 2002). The 'value proposition,' which is at the intersection of value creation, capture and delivery mechanism is often discussed among scholars in terms of innovative solutions offered by the businesses. Thus, scholars have studied business model innovation (BMI) quite a lot in relation to how the company has introduced new BM or improvised its existing BM.

Scholars often regard ‘sustainability’ as a source of innovation in BM literature. One of the early works by Girotra and Netessine (2013) highlighted that sustainability in business is not only achieved through innovation in technologies, products, and services but also through business model innovation (BMI). While technology innovation is usually limited to specific industries, the scope of business model innovation can be applied across a wide range of industries. Therefore, we can consider a sustainable business model (SBM) as an important aspect of BMI.

The initial conceptualization of SBMs has evolved to capture sustainable values and has become the new imperative for business success (Brennan & Tennant, 2018). SBMs account for sustainable value created in a collective effort of a network for relevant stakeholders cooperating through informal and formal arrangements and alliances. This enables them to contextualize the strategy embedded in the business environment (Beattie & Smith, 2013). SBM concepts are now well established to capture the strategic logic of creating superior customer value by contributing to sustainable development goals (SDGs) and meeting stakeholder needs. Integration of sustainability in core strategic processes has helped businesses achieve competitive advantage and contributes to its success (Hampl & Loock, 2013; Hult, 2011; Kolk, 2016).

The existing managerial literature is well-developed in addressing the importance of sustainable development from big, multinational corporations’ perspective (Dauvergne & Lister, 2012; Durst *et al.*, 2021; Tendera-Właszczuk *et al.*, 2024). While large corporations are influential due to the multinational reach of their impact, SMEs play a potentially very important role in creating a critical mass needed to truly implement sustainable business development at scale. Our research aims to shed light on current literature related to SBMs in the SMEs’ context. We applied methods of bibliometric literature review (Donthu *et al.*, 2021) to identify the most important topics and trends in scientific publications on sustainable business models related to SMEs and to discuss potential directions for future research.

This article is arranged as follows. The next section will discuss the materials and methods used to for bibliometric review of literature. This includes explanation of systematic process used for extraction of data from various database and use of “R” programming software to generate results. The third section will briefly discuss literature review in the given field and present the research questions and research objective. The fourth section will be dedicated for the explanation of the findings obtained from the data analysis. This section will include discussion on topics such as annual production of articles on SBM and SMEs, three field plots, co-occurrence network, thematic evolution and thematic maps. The last section will provide the conclusion and also highlight the limitations of this study.

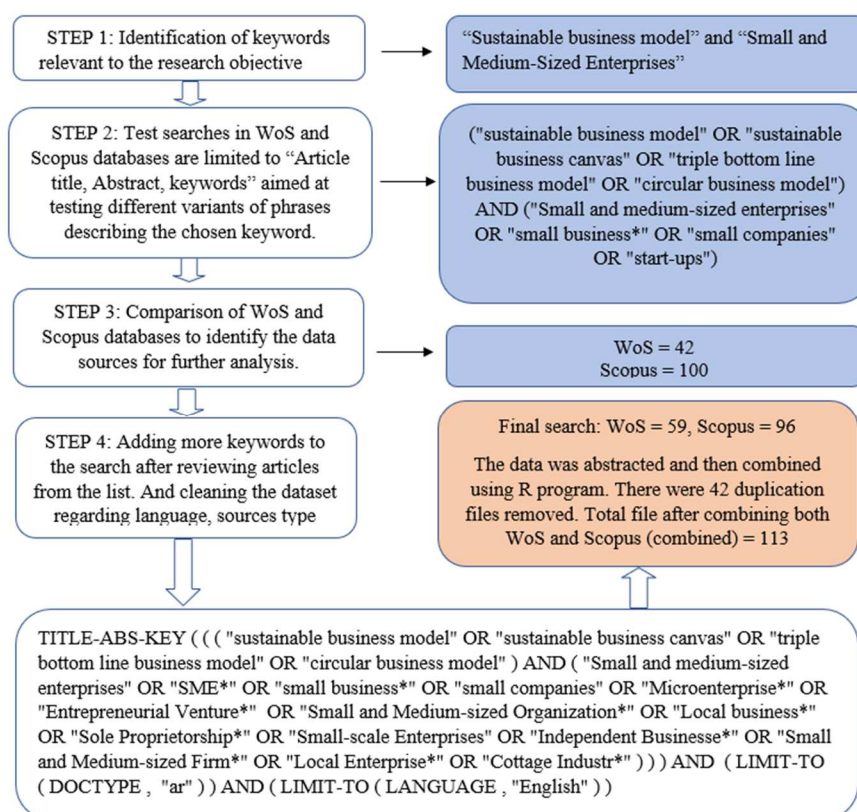
## MATERIALS AND METHODS

We used bibliometric analysis paired with a graphical mapping technique to explore the existing literature on SBM concerning SMEs. It categorises selected types of publications that are outlined in the SBM- and SME-related fields. We did it through the analysis of bibliographic records obtained from the Scopus and Web of Science (WoS) databases. Figure 1 explains the steps we followed to conduct the bibliometric literature review.

As mentioned in the steps in Figure 1, we used both Scopus and Web of Science (WoS) databases to conduct keyword searches. The main keywords we used were ‘sustainable business model’ and ‘small and medium-sized enterprises.’ We used the Boolean operator ‘AND’ to make the initial search. We refined the search by adding more synonymous words to the main keywords as presented in the various steps of Figure 1. By reviewing the abstract of some of the most cited articles in the given domain, we identified new keywords and added them to the search by using the Boolean operator ‘OR’ to the main keywords. We added new keywords until the point where the search result did not add a significant number of new articles to the list. We also used the asterisk (\*) as a wildcard character to represent a sequence of characters in a search query. Most of the abstracts that we reviewed for adding new keywords were from *Journal of Cleaner Production* and *Sustainability*.

The time frame of our search was from 2004, when the initial literature on business models emerged until 2023. We cleared the obtained data set concerning the following criteria: language (English only), and source type (scientific articles only). The final dataset obtained for Scopus was ninety-

six and for WoS – fifty-nine. After combining the findings and removing duplicate files, we obtained a final sample of 113 academic articles for further research.



**Figure 1. Stages of the research procedure**

Source: own elaboration.

To identify and depict the conceptual structure of the field, trends, and key topics, we applied centrality, density, and clustering concepts that are well-established in the field of social network analysis (Wasserman & Faust, 1994). We constructed the network based on the co-occurrence of words extracted from keywords, titles, and abstracts of articles from our sample collection of articles. By using the conceptual structural framework described by Aria and Cuccurullo, (2017), we used the co-word analysis to map and cluster terminologies obtained from ‘keywords, titles or abstracts’ in a bibliographic collection [NetMatrix <-biblioNetwork(M, analysis = ‘co-occurrences,’ network = ‘keywords,’ sep = ‘;’)] (Aria & Cuccurullo, 2017). We referred to the formula used for the co-word network from (Aria & Cuccurullo, 2017): ‘ $B_{coc} = A \times A$ , where  $A$  is a *Document*  $\times$  *Word matrix*, where *Word* is, alternatively, authors’ keywords, keywords plus, or terms extracted from titles or abstracts. Element  $b_{ij}$  indicates how many co-occurrences exist between words  $i$  and  $j$ . The diagonal element  $b_{ii}$  is the number of documents containing the word  $i$ ’ (Aria & Cuccurullo, 2017). We used the ‘Biblioshiny’ software associated with *bibliometrix* R-package to perform multiple correspondence analysis (MAC). This helped us to design a ‘conceptual structure’ of the field and to present a graphical mapping of bibliometric analysis (Aria & Cuccurullo, 2017). To identify clusters of documents, we used  $K$ -means clustering and applied MCA to a ‘*Document*  $\times$  *Word matrix*  $A$ ’ in a co-word analysis (Aria & Cuccurullo, 2017). These ‘words’ were plotted on a two-dimensional map ‘[CS <- conceptual Structure (M, field=‘ID,’ minDegree=5, k.max=5, stemming=FALSE), labels=5]’ (Aria & Cuccurullo, 2017).

We used the ‘authors keyword’ as a field and ‘Louvain’ as a clustering algorithm while producing various outputs using the Biblioshiny package. To understand thematic evolution and the creation of thematic map, we used different time windows (2004-2015, 2016-2018, 2019-2021, and 2022-2023). We did it to balance the number of articles that were growing slowly in the beginning, and rapidly in the later years.

## LITERATURE REVIEW AND THEORY DEVELOPMENT

### Previously Reviewed Articles on SBM Concepts

As the concept of SBMs has gained a lot of attention, many review articles on the given topic have been published lately (Bocken *et al.*, 2014b; Fobbe & Hilletoft, 2021; Geissdoerfer *et al.*, 2018; Khan *et al.*, 2021; Kluza *et al.*, 2021; Moro *et al.*, 2022; Schaltegger *et al.*, 2016). It is worth exploring how these articles have summarized their review findings. One of the early reviews conducted by Boons and Lüdeke-Freund (2013) highlighted that business models tend to disregard the accurate ways by which the firm associate 'value' elements presented in the definition of business model. Hence, they suggest to consider 'sustainable innovation' to possibly integrate these 'value' elements (Boons and Lüdeke-Freund, 2013). In their review article, Bocken *et al.* (2014a) proposed eight sustainable business model archetypes – 'maximize materials and energy efficiency; create value from 'waste'; substitute with renewables and natural process; deliver functionality, rather than ownership; adopt a stewardship role; encourage sufficiency; re-purpose the business for society/environment; develop scale-up solutions' (Bocken *et al.*, 2014a). These archetypes help to explain solutions that help in building the business model for sustainability. Schaltegger *et al.* (2016) reviewed several articles related to business models and sustainability to highlight the concept's evolution. The article explained that on the organizational level, the vision of sustainable development has led to the concept of sustainability management, corporate sustainability, sustainability innovation and sustainable entrepreneurship, and social business (Schaltegger *et al.*, 2016). Evans *et al.* (2017) reviewed several bodies of literature to examine whether and how business models can innovate to achieve sustainability goals. Based on the literature on business model innovation and sustainability innovation, the article identified five propositions that characterized SBMs (Evans *et al.*, 2017). The article by Geissdoerfer *et al.* (2018) was based on a structured literature review of 25 articles published in SBM innovation literature. This review article focused on improving the understanding of how organizations move to new, sustainable business models using the concept of business model innovation. Fobbe and Hilletoft (2021) systematically selected and thematically analysed forty-seven articles related to SBM elements. Their article states that stakeholder interaction is recognized as an essential element of SBMs and plays a significant role for sustainable value proposition, creation, and capture. The article by Khan *et al.* (2021) was based on eighty-one articles reviewed using the literature mapping review technique. The findings suggested that the majority of sustainability research focused on conceptual analysis. The article highlights that scholars often cite the 'Internet of Things' with an emphasis on achieving triple bottom-line benefits related to SBMs. Kluza *et al.* (2021) analysed research results published in over seventy-two articles using meta-analysis. The findings of the given review presented that cultivating social capital and emphasizing innovation affects SBM in a positive way for businesses operating in different countries all around the world (Kluza *et al.*, 2021). Recent article by Moro *et al.* (2022) reviews forty-eight publications related to product-service systems (PSS) and business models. PSS is a sustainable way to offer value to customers (Bocken *et al.*, 2014b; Boons & Lüdeke-Freund, 2013). PSS combines the three sustainability dimensions (economic, environmental, and social) in a holistic approach to meet customer needs (Vasanthan *et al.*, 2012), and focuses on value generation. Using content analysis, Moro *et al.* (2022) describe a mechanism for generating value from the PSS business model.

### A Review of the Literature on SBMs and SMEs

While most of the SBM literature is based on multinational corporations (Dauvergne & Lister, 2012; Durst *et al.*, 2021; Tendera-Właszczuk *et al.*, 2024), there has been an increasing number of articles published more recently to explore the SBM of SMEs. However, there are only a few review articles that focus on exploring the relationship between SBM and SMEs. One among such articles is a systematic literature review by Johnson and Schaltegger (2016b). They investigated sustainability management tools that SMEs use for various applications. Based on the meta-analysis and thematic analysis of 112 publications, they recognised in the literature 26 sustainability management tools that had direct linkage to SMEs. The findings suggest that most SMEs did not implement these tools. The article

explained the barriers to implementation and the key areas of improvement in its implementation. Given the complexities of small businesses, the article also suggested that the area of future research should focus on 'SMEs' to enrich the existing literature on sustainability management tools (Johnson & Schaltegger, 2016b). The review article by Miller *et al.* (2021) explores how the intrinsic heterogeneity attributes of SMEs influence the development of business model design, processes and driver of its value. The article presents the fact that SMEs represent a broader category of businesses that includes micro-businesses, small growing businesses, and medium-sized enterprises etc. with their own exclusive features and meaningful attributes (Miller *et al.*, 2021). The differentiating features of SMEs over large firms are their liabilities of smallness, and their size and resource constraints that limit their core competencies and capabilities (Lohrke & Landström, 2016).

The other recent article by Durst *et al.* (2021) provides a systematic literature review (SLR) of SBMs in SMEs to establish existing knowledge and suggest directions for future research. The SLR was based on 85 articles and the findings of the article help us understand that most of the research was done in the European context (52 articles), followed by the US, South America and Asia. Although some insights related to what was the area of research focus on these regions, there was no deeper understanding of the interlinkage between different themes and different countries. The article also highlights that 20 different theories served to study the topic under investigation. Among them, based on resource-based view (RBV) (6 articles), institutional theory (4 articles) and stakeholder theories (3 articles) were most frequently used. With regards to the methods, case study (31 articles) and mono methods (31 articles) were most widely used. The article also identifies five different themes based on how the articles explored SBMs from different perspectives. These themes were antecedents (24 articles), activations (21 articles), relational (15 articles), theoretical (14 articles), and effects (11 articles).

The previously reviewed articles provided a basic understanding of the existing literature on SBMs and SMEs. However, it has not presented a deeper understanding of how different thematic areas within SBMs are related to SMEs from various geographical regions. The existing literature also fails to examine how the literature on SBMs and SMEs has evolved in recent times, what are the interlinkage between different themes, and what is the future research direction. Therefore, our research presents an extension to existing literature particularly Durst *et al.* (2021) by presenting a more in-depth understanding of these topics. The bibliometric methodological approach used in this article differs from earlier systematic reviews, and it enables us to present and interpret unique pictorial outputs.

### **The Article's Objective and the Research Questions**

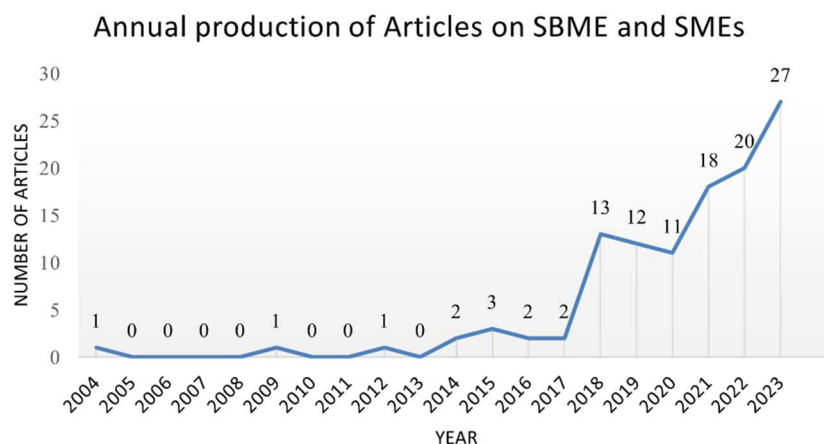
This article presents an in-depth review of the literature relating SBMs to the entrepreneurial activity of SMEs. To enable the above, we formulated three research questions that guide our research:

- RQ1:** In the context of SBMs and SME literature, what trends can we observe in annual scientific publications and how are they related to different countries and topics of sustainability?
- RQ2:** What are different thematic areas that have emerged in the literature and how are they related to SBMs and SMEs?
- RQ3:** How has the field of study evolved in recent times and what are the future research directions related to SBMs and SMEs?

## **DISCUSSION**

### **Annual Production of Articles on SBM and SMEs**

Over the last ten years, the publications of articles related to SBM, and SMEs have been in an increasing trend particularly after the year 2015 as indicated in Figure 2. This can also relate to the introduction of the UN SDG in 2015. The first scientific article was published in 2004. Until 2018, there were less than 10 articles published each year. Moreover, Figure 2 shows that, most of the articles related to SBM and SMEs were published in recent past (since 2017)s. The growth in the number of publication has been exponential in recent times compared to earlier years.



**Figure 2. Evolution of publication on SBM and SMEs literature, 2004-2023 (n =113)**

Source: own elaboration based on Scopus and WoS database.

Figure 3 below related to a three-field plot provides us with information on how different journals have been publishing articles on diverse topics related to research themes in various countries. We can observe that journals *Sustainability*, *Cleaner Production*, and *Business Strategy and the Environment* are the three key journals. ‘Circular economy,’ ‘sustainable business model,’ ‘SMEs’ and ‘sustainability’ were the four major research topics. Five important countries where these articles were published were Italy, the United Kingdom, China, the USA, and Poland. Figure 3 also shows the interlinkage between journals, keywords used and the origin of the authors’ country.

While *Sustainability* has been using all five keywords in the articles it published, it is worth noting that the *Journal of Cleaner Production* has been using ‘SBM,’ ‘circular economy’ and ‘SMEs’ as the keywords in most of its publications. Similarly, the keyword ‘SBM’ was most frequently among authors from all five different countries. However, it appeared most frequently in the articles published in the *Sustainability* and *Journal of Cleaner Production*, with very few in the *British Food Journal*. The keyword ‘circular economy’ was most popular among authors from Italy, the UK and Poland whereas, the keyword ‘SMEs’ – among authors from Italy and the United Kingdom. The sources of both the keywords were mainly *Sustainability* and *Journal of Cleaner Production*.

### Co-occurrence Network

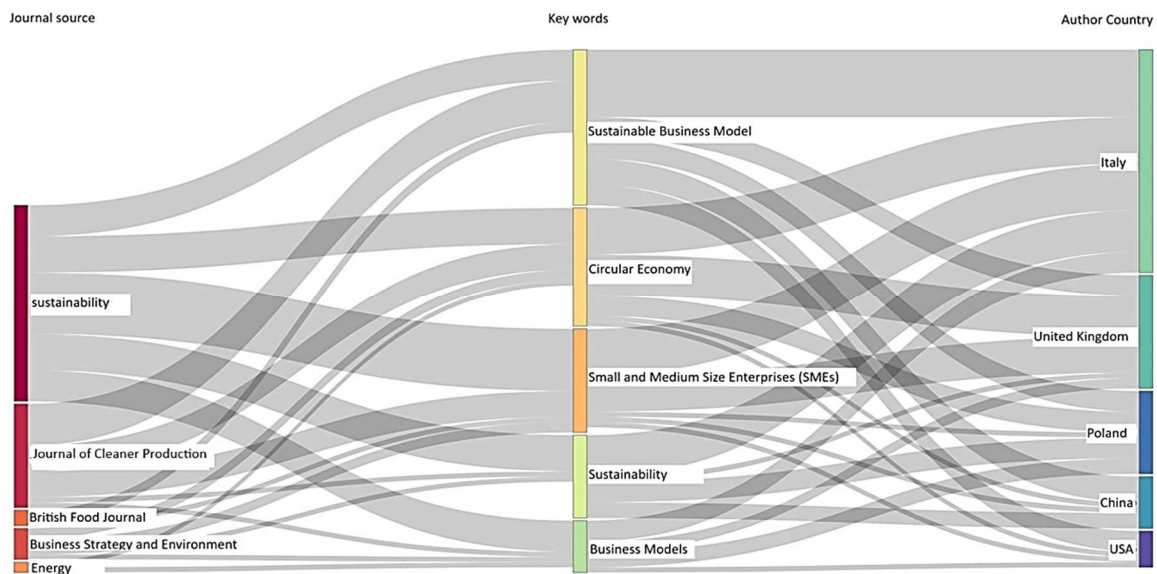
The co-word analysis serves in a ‘co-occurrence network’ to determine the conceptual structure of a framework (Aria & Cuccurullo, 2017). To identify connections between keywords we used the ‘keyword co-occurrence analysis’ (Aria & Cuccurullo, 2017). This helped us identify ‘thematic areas’ assembled into ‘thematic clusters’ to showcase the most important ‘theoretical or foundational topics’ of the given research field (Fakhar Manesh *et al.*, 2021).

To analyse the ‘co-occurrence network,’ we used ‘50’ as the number of nodes and the minimum number of edges equals ‘2’ in Biblioshiny software to obtain the result as shown in Figure 4. We observed twenty-eight nodes organized in four different clusters. The red cluster has twelve nodes, blue has six nodes, purple has three and green has seven nodes. The size of the bubble represents the ‘frequency of words’ – the bigger the size, the higher the frequency of words being used. Similarly, the line connecting each bubble represents linkage/connection among keywords with each other.

The red cluster has ‘SMEs’ as the biggest bubble. The given bubble has a direct linkage with all the other bubbles in the same cluster as well as some of the bigger bubbles in the other clusters. We can observe that there is a strong interlinkage among SMEs, SBM, and the circular economy. Strong linkage between SMEs, sustainability and circular economy (within the red cluster) can indicate the fact that most of the research on SMEs and sustainability is based on circular economy. The other bubbles in the red cluster are also related to the concept of circularity. Circular business model, circular design, and circular business innovation in the red cluster indicate that research in the given cluster is related

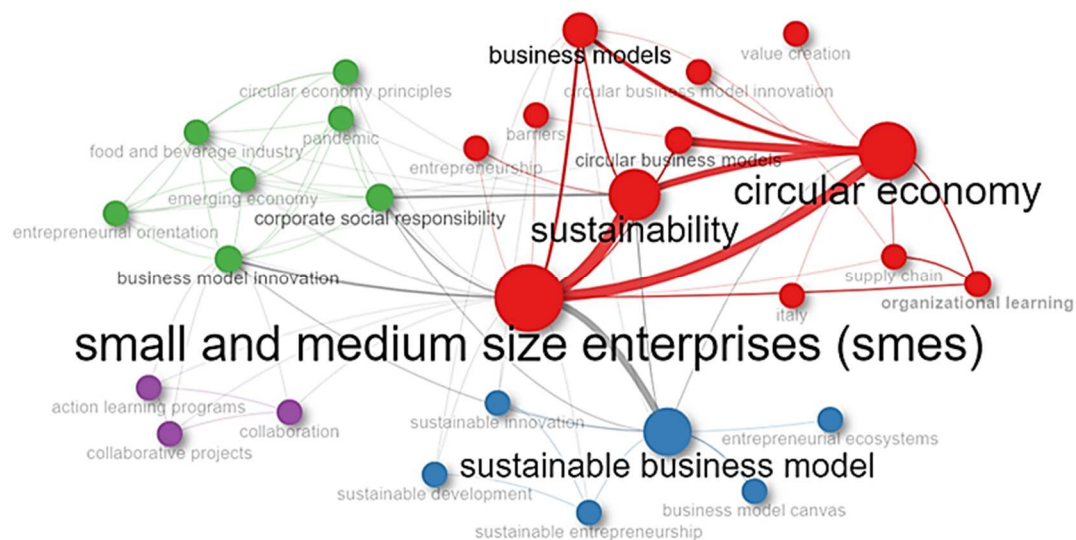


to the core theme of 'circular economy.' This indicates that the red cluster is more linked to SMEs' engagement in sustainability through circular economy by using the concept of circular business model. Therefore, we can associate the given cluster with an 'SMEs and circular economy' theme.



**Figure 3. Three field plots**

Source: own elaboration using Biblioshiny software of R programming.



**Figure 4. Co-occurrence Network**

Source: own elaboration using Biblioshiny software of R programming.

The blue cluster has a sustainable business model (SBM) as the biggest bubble. The other bubbles in the given cluster are sustainable innovation, sustainable development, sustainable entrepreneurship, and business model canvas. There is a strong interlinkage between the SBM of the blue cluster with SMEs in the red cluster. Moreover, SBM is linked with the circular economy (red bubble) and corporate social responsibility (green bubble). These interlinkages help us understand how different keywords belonging to different clusters are related to each other.

The cluster of green bubbles represents more of the keywords related to different thematic areas. The bubble size is relatively the same and keywords such as 'corporate social responsibility,' 'business model innovation,' 'entrepreneurial orientation,' and 'circular economic principles' seem to have closer linkage with other clusters. It is worth noting how business model innovation is interlinked with

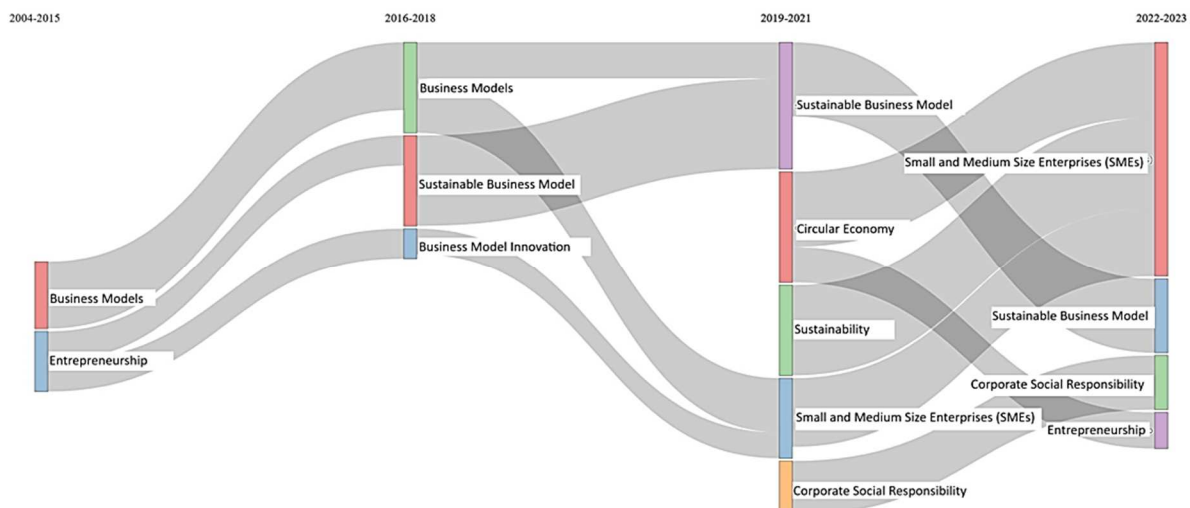
sustainable innovation which further has a strong linkage with SBM. This re-emphasizes the importance of sustainable innovation as an integral part of the BMI of businesses.

Similarly, the purple cluster has a few bubbles related to collaborative projects and action learning. We can observe that this cluster is more linked with the BMI of the green and red clusters and SMEs of the red cluster. This observation helps us understand how SMEs use collaborative approaches in achieving BMI.

### Thematic Evolution Sankey Diagram

Figure 5 represents the alluvial diagram used for visualizing the ‘thematic evolution’ of the research field for the period 2004–2023. We divided the field into four time periods (2004–2015, 2016–2018, 2019–2021, and 2022–2023). The reason for choosing the given time frame was because there has been an increasing number of research published in the given domain since 2015 as presented in Figure 2. Moreover, the introduction of UN-SDG in the year 2015 can help us better understand how thematic evolution in research has emerged since then.

Articles published before 2015 were based on themes of business mode and entrepreneurship. In the 2016–2018 period, new thematic areas such as ‘sustainable business model’ and ‘business model innovation’ emerged. Similarly, topics related to ‘circular economy,’ ‘sustainability,’ ‘sustainable business model,’ ‘SMEs,’ and ‘corporate social responsibility’ were core themes in the period of 2019–2021. In recent years (2022–2023), we can observe that the research themes related to ‘SMEs’ have a direct linkage with research domains such as ‘circular economy’ and ‘sustainability.’ Similarly, the ‘sustainability business model’ has been linked with concepts related to ‘business model.’



**Figure 5. Thematic evolution**

Source: own elaboration using Biblioshiny software of R programming.

### Thematic Map

‘Thematic map’ helps us recognize the concentration of research in diverse groupings (Mobin, 2021). The dotted lines presented in Figure 6 divide the map into four quadrants based on ‘density and centrality.’ The ‘centrality’ of a theme is referred to as ‘the extent of the relation among distinct topics,’ and the ‘density’ implies its progress (Nasr *et al.*, 2021). Figure 6 presents the concentration of our themes based on our dataset. As explained by Rejeb *et al.* (2022) the number of publications in which the ‘keyword’ appeared, determined the ‘bubbles sizes.’

The themes with ‘high density’ and ‘high centrality,’ are often called ‘motor themes.’ This is represented by the first quadrant. These are well-developed themes with strong internal and external ties. In recent years (2022–2023) as presented in Figure 6, topics related to ‘sustainable leadership,’ ‘fashion industry’ and ‘resilience.’ The second quadrant with high density and low centrality is often regarded



as '*highly-developed-and-isolated themes*' and is also called '*niche theme*.' This theme has well-developed internal ties and marginally significant external ties. For 2022-2023, the key thematic areas were related to 'corporate social responsibility,' 'business model innovation,' and 'circular economy principles. The third quadrant is represented by low density and centrality values and is called '*emerging-or-declining themes*.' This quadrant has weak internal and external ties. It mainly represents either emerging or disappearing themes. The fourth quadrant with low density and high centrality is often called '*basic-and-transversal themes*.' It has 'well-developed' external ties and insignificant internal ties and these themes are important for the research field but are not well developed. Based on our results 'circular economy,' 'SMEs' and 'sustainability' are the most important thematic areas in this quadrant.

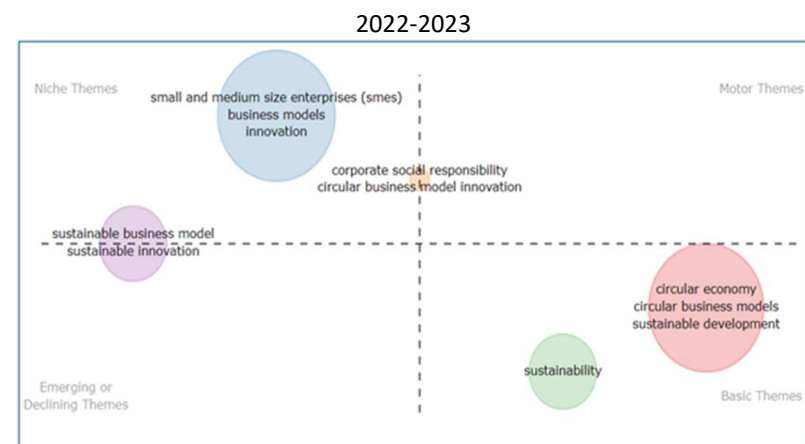
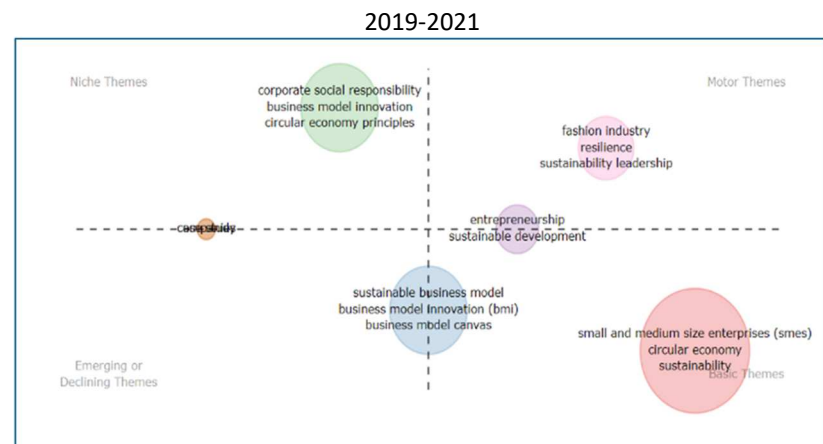
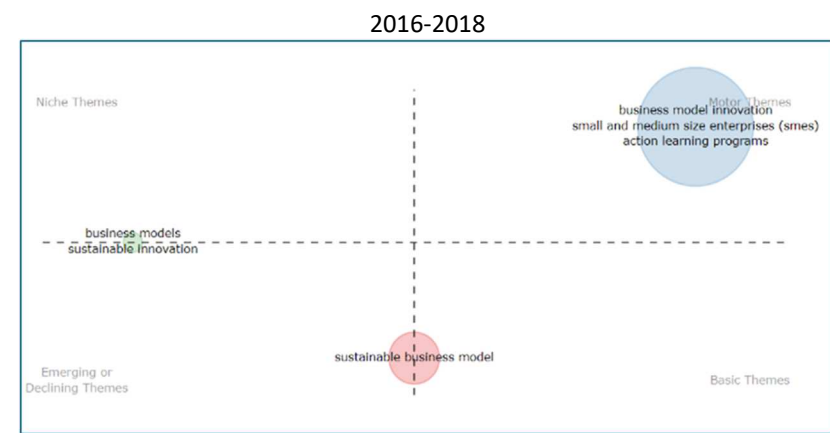
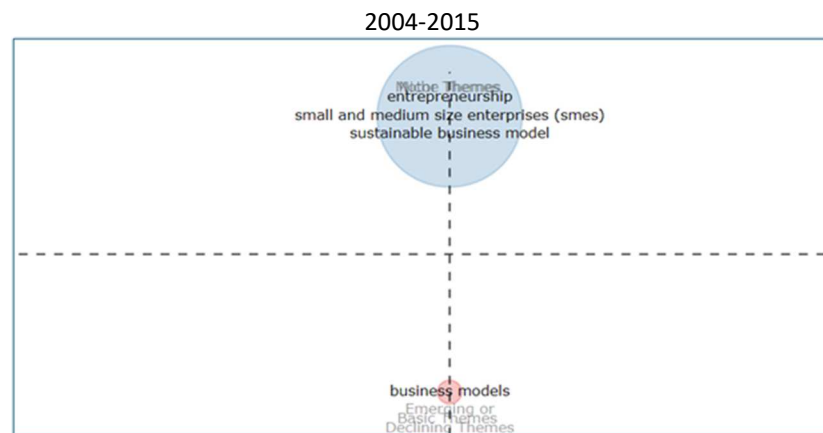
### Discussion

We attempted to further enhance the body of knowledge in the existing literature on SBM in relation to SMEs. We conducted a review of previously reviewed articles related to SBM first, and then SBM concerning SMEs next. The findings of 8 previously reviewed articles of SBM helped us develop our understanding of how the business model concept has evolved in recent years to integrate components of sustainability.

The review articles by Boons and Lüdeke-Freund (2013), Evans *et al.* (2017), Geissdoerfer *et al.* (2018) Kluza *et al.* (2021) highlight how organizations move to new, sustainable business models using the concept of business model innovation. The relationship of innovation to SBM presented in the past reviews is in line with the findings we presented in the co-occurrence network (Figure 4) where keywords such as 'business model innovation,' 'sustainable innovation,' 'circular business model innovation' have appeared as a distinct node. Moreover, the thematic evolution (Figure 5) presents the presence of 'business model innovation' as a key construct that evolved between 2016-2018. In addition to establishing the relationship and validating the past findings, our article presented the pictorial output to showcase the interlinkage among different nodes, to help us understand the integrated relationship that exists among different variables. This provides much better insights than the linear relationships explained in the existing literature. Similarly, the evolution of the new themes presented in the thematic map (Figure 6) and thematic evolution (Figure 5) in recent years particularly after the introduction of SDGs can be related to the findings presented by Schaltegger *et al.* (2016) that explains the relationship between sustainable development and key concepts such as sustainability management, corporate responsibility, sustainability innovation, sustainable entrepreneurship, and social businesses.

With regards to review based on SBM and SMEs, we considered two previously reviewed articles by Johnson and Schaltegger, (2016b) and Durst *et al.* (2021) for the review. The research findings of these articles helped us not only develop a specific understanding of the topic but also define gaps in the literature and frame our research objectives. A review by Johnson and Schaltegger (2016b) highlights the barriers to implementing sustainability management tools among SMEs because of the peculiarities and complexities of their business operation. Therefore, emphasizing the need for strong SME-based research in the context of SBM. This helped in justifying the need for our research as it provided us with an in-depth understanding of the various aspects of a given topic. Similarly, a systematic literature review by Durst *et al.* (2021) helped us shape our current research objective by identifying gaps in existing literature. To address the gap, we proposed various thematic clusters, the evolution of various themes, and the mapping of various research concepts in the given article. Therefore, this strengthens our justification for the relevance of conducting this research using the bibliometric literature review technique. We also investigated the SBM, and SMEs related research articles over the last 20 years (2004-2023) using bibliometric analysis. We used 113 articles (mostly research articles) from sixty-four diverse sources for our data analysis and came up with the findings to answer our research questions.

Corresponding to the first research question, we observed the increasing trend (Figure 3) in the research outputs concerning SBM and SME literature over time, and the expansion of geographical and cultural contexts of the research in the field of entrepreneurship. Among journals we see two venues, *Sustainability* and *Journal of Clean Production* foster a lot of discussion and development on the given research domain. In terms of countries from which authors originated, Italy, the UK, the Netherlands, and Poland were on the frontline of researching the given domain. Among Asian countries, only China



**Figure 6. Thematic evolution**

Source: own elaboration using Biblioshiny software of R programming.

seems to appear on the list, with Southeast Asia, Korea and Japan largely missing. Also, the American context is limited to the US and underrepresented concerning the size of economies, populations, and sustainability challenges ahead. Based on these observations we expect increased interest in the topic of SBMs in the Americas and Asia. These findings correspond to the findings of (Durst *et al.*, 2021) which presented similar results. However, in addition, our research findings established a link between journals, keywords used and the origin country of the authors (Figure 3). By analysing the bibliometric data available for all the reviewed articles establishment of this relationship was possible. The pictorial representation helps us provide a good understanding of the interlinkage among all three variables. Relating Figure 2 and Figure 3, we can also conclude that the majority of the research on the given field took place in the last five years (2018-2023) and most of it in the European context.

Concerning our second research question, we found that 'circular economy' is the key topic when it comes to the literature of SBM concerning SMEs. The findings of the co-occurrence network analysis (Figure 4) presented us with the fact that the topic of circular economy and other concepts related to circularity, for example, circular business model, and circular business model innovation were found in the same cluster. These clusters were strongly connected. This indicates that the current SME literature frequently discusses the theme of circularity. The thematic evolution (Figure 5) also presents a strong linkage between the 'circular economy' and SMEs in recent years. The basic themes in the thematic map (Figure 6) have evolved. In the early days of 2004-2015, business models were on the border between emerging themes and basic themes. Later, sustainable business models replaced them in the same position. Basic themes only emerge in 2019 around topics of circular economy, circular business models, sustainable development, and separate literature discussing sustainability in general. These streams of research further converge into one area of literature relating SMEs, circular economy, and sustainability in recent years from 2022 to 2023. Although the linkage between SMEs and SBM seems to be strong, they appeared in different clusters which means the overall theme of the research conducted in each domain was different.

To answer the third research question, we can refer to the thematic map and thematic evolution to understand the future research direction. The topics that seem to be emerging in recent years, shown as motor themes in our thematic analysis for years 2022-2023 (Figure 6) are the fashion industry, resilience, and sustainability leadership. The explanation for the rising interest in the fashion industry could be the recent SCOS Conference in Paris with the leading theme of Haute Couture. Resilience became very important due to rising disturbances in international trade and global supply chains. The third emerging topic of sustainability leadership replaces earlier conceptual lenses of corporate social responsibility, more popular in earlier years of the domain under investigation. The thematic evolution (Figure 5) presents that research on 'SMEs' has a backward linkage to 'circular economy' and 'sustainability.' This indicates that SBM, with regard to SMEs, is an emerging field. 'Sustainable business model' as a research theme has a backward linkage to 'entrepreneurship.' Over the past decade, this indicates the research topic on entrepreneurship has evolved to focus more on SBM and due to the rising importance of sustainability debate we expect more exciting conceptual frameworks and research to come soon.

## CONCLUSIONS

The results of the bibliometric analysis have provided an in-depth and clear understanding of the thematic mapping, thematic evolution, thematic cluster, and other valuable information relevant to SBM and SME literature. The pictorial representation of each output helps us better visualise the concepts and makes it easy to summarize the findings more pragmatically. The review of previously reviewed literature on SBM and SBM in relation to SMEs is also an attempt to contribute to the existing literature and justify this research work. The findings of our research suggested that limited research of SBM among SMEs of Asian countries (particularly South Asia), Americas and African countries found in the existing literature suggests the possibility of future research in the given regions. The findings of the co-occurrence network analysis provided us with valuable insights that SBM and SMEs are in two different clusters. This again re-estates the fact that there is a scant of research directly linked to SBM

and SMEs. Research on SMEs is more linked to circular economy, business model, and the concept of sustainability. However, the adoption of SBM as a business strategy for SMEs still bears the challenges. This corresponds to the findings of Johnson and Schaltegger (2016b) who highlight the peculiarities and complexities of their business operation of SMEs in implementing sustainability tools. Our contribution in this article is the use of novel, bibliometric analysis methods that helped us identify the conceptual structure of literature relating sustainable business models in relation to SMEs and to propose key directions for further research. This methodology allowed us to present how different thematic areas within SBMs are related to SMEs and the geographical focus of earlier studies.

The existing review is established on the bibliometric data obtained from Scopus and the Web of Science database. We did not include articles published in grey literature, non-academic research, and research based on other languages. Therefore, the selected articles that we reviewed seem to have geographical biases as most of the articles published in these two databases are from European or American contexts. Further studies may include literature from multiple databases to enlarge the sample size and include different geographies. Small and medium-sized enterprises are defined differently in statistical terms across the globe. For example, SMEs are companies that employ less than 250 employees in Europe, 500 employees in the US and 3000 employees in China (Steinhäuser *et al.*, 2020). As our sample is constructed from articles in which actors self-defined firms under investigation as SMEs, the research we are further analysing in our bibliometric review may not be completely coherent. Despite these limitations, we believe that the current study has provided a state-of-the-art literature review with regard to developing our understanding of the SBM related to SMEs.

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#### Authors

The contribution share of authors is Binayak Malla (BM) – 65% and Michał Zdziarski (MZ) – 35%. BM took the lead in conceptualizing the framework of the article. His major contribution was writing the literature review section, methodology section, data analysis and interpretation of result sections. He also contributed equally to the discussion and conclusion section. MZ, contributed to conceptualizing the framework of the article, writing the introduction section, defining the objective of the research, participating in the data analysis and interpretation of results and elaborating the discussion and conclusion section. He also contributed to reviewing the overall article to give it a proper shape.



**Binayak Malla (corresponding author)**

Assistant Professor at the School of Management, Kathmandu University (KUSOM), Nepal and PhD candidate at the University of Warsaw. He has diverse research interests and believes in conducting transformative research. His recent publication as a co-author is based on a topic titled 'Lessons learned from top global companies on UN SDGs.' He also co-authored two other articles related to understanding the 'impact of street harassment in the marketplace' and 'Nepalese migrant workers in the Middle East.' As an international business practitioner, he established a company called Vu Devi Services Pvt. Ltd. that provides services related to business process outsourcing to overseas clients. He has also taken the initiative of establishing multiple businesses related to coffee- farming (Jewel Himalayan Coffee Beans), coffee trading (Jewel Himalayan Products), and café businesses (Inaya Café) that help in promoting Nepali coffee in the international market.

**Correspondence to:** Mr. Binayak Malla, Pinchhe tole, Balkumari, 44-700 Lalitpur, Nepal. e-mail: malla.binayak@kusom.edu.np, b.malla@uw.edu.pl

**ORCID**  <https://orcid.org/0000-0001-7858-2838>

**Michał Zdziarski**

Associate Professor at the University of Warsaw, the Faculty of Management. He is also a lecturer of Sustainable Business Strategy at the University Centre for Environmental Studies and Sustainable Development and a member of the Management Committee of the COST Network 'Efficient Justice for All: Improving Court Efficiency through EU Benchmarking.' He was a Senior Visiting Scholar to Corpnet, University of Amsterdam, and the Institute for Manufacturing, University of Cambridge, and a Senior Researcher at The Conference Board Europe. His current research interest focuses on top management teams, strategy, corporate governance, sustainability, and organizational networks.

**Correspondence to:** dr. hab Michał Zdziarski, Associate Professor, Ul. J. Falata 6 m 38, 02-534 Warsaw, Poland. e-mail: m.zdziarski@uw.edu.pl

**ORCID**  <https://orcid.org/0000-0002-5911-0090>

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**Use of Artificial Intelligence**

The authors confirm that the text is free from AI/GAI.

**Conflict of Interest**

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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