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Transitioning Drivers from Linear to Circular Economic Models: Evidence of Entrepreneurship in Emerging Nations

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Abstract

Purpose. Various publications have extensively documented the advantages of a circular economy in ensuring sustainability and limiting climate change. Despite academic records emphasising the need to adopt this business strategy, entrepreneurs in developing countries prefer linear economies. This reluctance is attributable to several factors, including insufficient infrastructure and technology, limited financial access, inadequate education systems, and the prevalence of informal enterprises. Therefore, a thorough analysis of the underlying economic, political, and social conditions is required to identify the drivers of circular economies and their contribution to entrepreneurship in developing countries.

Method. In this study, we first conducted a comprehensive quantitative literature review based on LangChain to identify the critical circular economy drivers from the social, technological, and organisational perspectives. Based on the input from the expert panel of Iranian academic and industry professionals, we applied an integrated fuzzy interpretive structural modelling and cross-impact matrix multiplication approach to classification (Fuzzy-ISM-MICMAC) to investigate the chronology of entrepreneurial drivers.

Findings. Level-based model results reveal entrepreneurial drivers in developing nations and their interrelationships, specifically underlining the importance of supply chain factors and stakeholder preferences. Thus, the differences between the perception of the main drivers in developed and developing economies can be identified, with the former paying particular attention to legislative and financial factors. The study's findings contribute to conserving resources, reducing waste, and adopting more sustainable corporate practices, thereby assisting developing countries in achieving development goals.

Originality. This study employs an innovative quantitative systematic literature review approach that relies on a large language model to identify the drivers of the circular economy. Furthermore, it adopts a systematic approach to examine the enablers of the circular economy rather than a narrow and individual perspective of the entrepreneurial drivers. The study employs the fuzzy ISM MICMAC technique to showcase the prioritisation of entrepreneurial prospects in emerging economies.

Keywords. Interpretive Structural Modeling (ISM), Cross-Impact Matrix Multiplication Approach Applied to Classification (MICMAC), Fuzzy sets, Linear Economic Models, Circular Economic Models

Introduction

The circular economy is a cutting-edge and practical approach to waste management and resource scarcity. Its fundamental ideas include waste reduction, material utilisation, and natural system regeneration (Rodríguez-Espíndola et al., 2022). This business model is intended to reduce resource consumption by decreasing waste and maximising existing resources while renewing biological systems (Chen & Kim, 2019). It is an efficient and sustainable approach to managing resources and is gaining popularity in various businesses, from fashion to manufacturing, especially in developed nations (Kirchherr et al., 2017; Huysveld et al., 2019). By reducing the costs associated with raw resource utilisation, adopting this strategy, unlike the conventional linear economy model, helps companies gain financial growth while reducing negative environmental repercussions and offering long-term sustainable success (Ozili, 2021).

A key factor in transitioning to the modern Circular Economy (CE) business model is a top-down corporate belief among governments, stockholders, and industrial members in moving towards a green society (Maranesi & De Giovanni, 2020). Several laws and regulations, such as subsidies, facilitate manufacturing, leading to long-term sustainability and customer benefits (Haleem et al., 2021). As a practical move, European nations have promoted waste reduction, recycling, and resource efficiency through Sustainable Development Goals (Wackernagel et al., 2017). These regulations promise industrial benefits and have positive social and environmental impacts (Olalekan et al., 2019). Accordingly, green branding and a favourable image among consumers for socially and environmentally prioritising sustainability (Chamberlin and Boks, 2018) or new avenues for expanding product and service expenditure through CE are the benefits of adopting this business model.

Even though the circular economy has gained popularity, businesses in developing economies must continue exploring circular model ideas further. This issue must be examined through the lens of "entrepreneurship drivers in developing nations" and their "distinct business environment" (Wu et al., 2021). Studies have shown that policies in developing countries prioritise short-term success in the business environment, leading to a varying focus on prioritising CE practices compared to industrialised nations (Ferronato et al., 2019). Consequently, supply chain practices such as planning and sourcing differ from what we are familiar with in industrialised nations (Murray et al., 2017). In these countries, KPIs are defined based on short-term economic growth rather than sustainable applications, which should be considered when seeking entrepreneurship in developing nations (Garcés-Ayerbe et al., 2019).

According to Devkota et al. (2022), entrepreneurship in developing countries should be encouraged due to technological advancements, growing population, and affordable labour costs (Foroozanfar et al., 2022). Babatunde et al. (2021) also suggest that population growth can lead to increased consumer education and the potential for adopting green product usage. Understanding the factors that drive the transition towards a circular economy in developing nations is of utmost significance. These countries are primarily affected by issues such as inadequate sustainable waste management solutions and plastic waste, as Tura et al. (2019) reported. Additionally, the innovative and technological entrepreneurship capabilities of these

nations, highlighted by Singh & Gaur (2018), further emphasise the need for research in this area.

Nevertheless, Inspired by research conducted in a developing country that attempts to move towards sustainability, with a particular emphasis on the financial challenges faced by developing countries (Khan et al., 2022), it is necessary to identify and prioritise the drivers of entrepreneurship that facilitate the creation of a circular economy. This process will ensure that the required resources are available for successful business model adoption. Hence, this study delves into the main drivers facilitating entrepreneurship investments toward circular economies in developing countries for their unique context and the difficulties in benchmarking CE practices from industrialised nations and directly applying them to developing nations (Kiselev et al., 2021).

Numerous research studies have aimed to uncover the factors that influence the adoption of circular economy practices (Barros et al., 2021; Gue et al., 2020; Qu et al., 2022; Tan et al., 2022; Neligan et al., 2023). However, this study stands out for its focus on understanding these drivers within the context of developing countries. Furthermore, we have utilised the ISM MICMAC approach to prioritise and map these findings, ensuring a safe implementation of circular economy practices in the future. Instead of the standard literature review, our research incorporates a unique review method that leverages the LangChain package to extract the initial drivers from the past decade's research results.

The following research initially examines the existing literature to identify the critical drivers of circular economies from various social, technological, and organisational perspectives. As the second step, To collect the initial CE drivers, we use an expert panel of academics and industry representatives to test the theoretical foundations further. The analysis is subsequently conducted using a combination of fuzzy interpretive structural modelling (ISM) and the Matrice d'Impacts Croisés Multiplication Appliquée á un Classement (MICMAC) technique applied to the collected data on the importance and interaction between different drivers. Finally, this study compares and maps drivers in developed countries, identified through a literature review, with empirically determined drivers in developing economies.

Concerning the influence of research records, such as Gusmerotti et al. (2019), the following research adds to prior knowledge by identifying these drivers specifically for developing nations and indicating that they should be prioritised for implementation by practitioners in the future. From this perspective, we encourage future research to address CE entrepreneurship challenges and drivers concerning their feasibility priority. The outcomes of this analysis can provide valuable insights for business owners and policymakers to develop effective policies and procedures for developing countries to implement circular economic principles.

Literature Review

The impact of entrepreneurship on promoting circular economy practices in emerging countries cannot be overstated (Rok & Kulik, 2021). Over the last few years, researchers from diverse

fields have analysed the obstacles and motivators of circular economy entrepreneurship in emerging nations through socioeconomic, environmental, technological, and organisational lenses (Agyemang et al., 2019). Our world is increasingly turning to a circular economy, and entrepreneurs have an ever-growing opportunity and responsibility to play a leading role in this movement. While there has been increased awareness of the influence of entrepreneurship on emerging countries, more research needs to be conducted to understand better how developing countries can lead to an environmentally sustainable future. Entrepreneurs, rather than governments, are trailblazers, risk-takers, and changemakers. They are positioned to identify market inefficiencies and initiate solutions to meet the growing demand (Al-Awlaqi & Aamer, 2022). By adopting a circular business model, entrepreneurs worldwide can generate job opportunities, stimulate economic growth, and minimise the environmental impact of production and consumption (Cullen and De Angelis, 2021).

Developing nations face an uphill battle regarding infrastructure and resource constraints, which can slow or hamper their ability to lean into a circular economy. Encouraging innovation and entrepreneurship can overcome these barriers by creating new business practices that are more resource-efficient and sustainable (Chiappetta Jabbour et al., 2020). Innovative thinkers can construct new recycling and waste management infrastructures, encourage new products from recycled materials, and advocate using renewable energy sources (Buch et al., 2021). By leading a business, entrepreneurs can drive circular economic practices among consumers, governments, and other stakeholders (Elf et al., 2022). Circular business ventures can establish the viability and profitability of these practices, providing a blueprint for others to emulate (Veleva & Bodkin, 2018). This creates a domino effect for the widespread adoption of sustainable economic practices.

However, before encouraging the widespread adoption of circular economic practices, we must explore entrepreneurs' motivations to start and grow their businesses. As mentioned earlier, CE requires top-down considerations. Governments should be committed to promoting such practices through supportive policies, tax incentives, subsidies, Research and Development (R&D) financing, and streamlined processes to start new businesses (Guldmann & Huulgaard, 2020). In addition, market structure and financial feasibility should be considered for entrepreneurship (Govindan and Hasanagic, 2018). The feasibility assessment of resources as a rudimentary motivator for entrepreneurship in emerging nations opens up ventures for better investment decision-making. Data availability and big data are pivotal for such decisions (W. Khan et al., 2023). These assets include natural and human resources, capital, technology, and infrastructure, which provide investors with a clear vision of what to expect and how to measure their performance (Veleva and Bodkin, 2018). Entrepreneurs in these nations must leverage resources to create solutions that address waste and environmental degradation. Accordingly, natural resources such as sunshine are considered valuable assets in an all-year sunshine nation as a renewable energy solution. However, sufficient data should be available to promote such investments in developing nations (Bist et al., 2020).

Marketplace and customer behaviour are pivotal factors in encouraging circular economy adoption in emerging nations (Dzogbenuku and Keelson, 2019). The rising demand for circular

economic practices, combined with the importance of sustainability, generates new business opportunities for entrepreneurs in emerging nations and an arsenal of consumers that can support the growth of these businesses (Sulaiman et al., 2022). While the marketplace significantly impacts entrepreneurship investments, the business should be high yielding for investors (Łękawska-andrinopoulou et al., 2021). This refers to a form of investment in which the entrepreneur is optimistic about the return on the investment for the initial CE investment by realising its potential impacts. Many financial resources aid entrepreneurs in promoting CE adoption. Among these, investments from venture capital firms, angel investors, government agencies, or access to microfinance programs are the most prominent resources (Cezarino et al., 2019). Smart funding empowers entrepreneurs to secure the resources they need to develop and grow their businesses, particularly in the early make-or-break stages of CE development (Chowdhury & Maung, 2022).

Although these factors are essential to CE entrepreneurship, the role of technology cannot be overstated. Smart incorporation of technology helps managers grow faster and reach maturity (Kayikci et al., 2022). Much evidence shows the role of Industry 4.0 and customer perception in business model success. Digital technologies like blockchain or 3D printing have great potential for leveraging CE practices (Huynh, 2022). Meanwhile, evidence shows that the practical utilisation of technology leads to social engagement and collaboration which is essential for long-term sustainability, as a case study on augmented reality has shown (Katika et al., 2022). Considering the environmental effects of CE, technology has been proven to leverage CE practices by managing resources and energies in the prefabricated construction business using VR, highlighting these assets' importance in promoting sustainability (O' Grady et al., 2021).

To expand our understanding of the determinants that impact the emergence of social entrepreneurship in developing nations, we thoroughly examine the literature to categorise and classify as many entrepreneurial motivators as feasible into discrete groupings to augment our knowledge of social entrepreneurship motivators in developing economies. We initially sought to identify as many drivers as possible, and by collecting over 200 recent research records, we needed to group the identified drivers into a narrower classification. We conducted a systematic literature review of these findings as a conventional methodology for understanding these drivers. However, the traditional methodology is often time-consuming and inaccurate (Sabharwal & Miah, 2022). Therefore, several intelligent methodologies, such as Latent Dirichlet Allocation (LDA) topic modelling, have recently been proposed to provide more valuable insights and text summarisation (Rani & Lobiyal, 2021). Hence, Python's LangChain model (Chase, 2023) was employed to confirm our initial findings. This framework was used to develop applications powered by language models. It allows the interpretation of written manuscripts based on the Large Language Model (LLM) and then interacts with the model with the environment for smart queries. This model is beneficial because it can save time and provide precise answers based on documents provided to the database. Finally, we ran multiple tests to ensure that all the categories were combined into distinct and narrow categories. For instance, digital innovation, blockchain, or 3D printing use in a circular economy was identified as "Technological Advancements", for a deeper understanding of their impact on circular economy businesses. The decision to classify drivers into the eight distinct categories proposed

in Table 1 was made to simplify the understanding of circular economy entrepreneurship among practitioners and experts. Practitioners and experts can better understand the critical drivers applicable to their contexts through a streamlined and focused framework. In addition to reducing bias in expert responses, this classification saves time during the questionnaire fill-out process. In addition, practitioners and experts can make informed decisions about the future of circular economy entrepreneurship in emerging nations using a clear and concise classification system. A solid understanding of the critical drivers allows them to make strategic decisions that align with the local market needs and promote sustainable and cyclical growth.

Table 1. Entrepreneurial circular economy enablers in emerging countries (Source: Created by authors)

ID	Driver	Correspondence to Entrepreneurship in emerging countries	Recent studies
D_1	Environment	Environmental concerns have a significant impact on entrepreneurship. The literature demonstrates that environmental degradation has a direct impact on resource availability. Such changes could raise operating and production expenses, limiting entrepreneurs' willingness to invest in developing countries. The successful implementation of the circular economy business model in industrialized countries has resulted in improved resource management and a higher competitive advantage over competitors.	(Zhu et al., 2019), (Kasmi et al., 2022), (Kuzma et al., 2021), (Joensuu et al., 2020), (Abad-Segura et al., 2020)
D_2	Technological Advancements	With recent technological breakthroughs, research findings that investigate the influence of industry 4.0 technologies such as augmented reality, virtual reality, blockchain, and collaborative platforms on circular economies demonstrate their beneficial impact and how they stimulate innovation in industrialized organizations. Incorporating technology is so critical in circular economies as it results in cost savings and increased efficiency.	(Wilson et al., 2022), (Ilić et al., 2022), (Manea et al., 2021), (Chau et al., 2021), (Kouhizadeh et al., 2019), (Cagno et al., 2021)
D_3	Legal and Regulatory	Governments have been shown to have a critical role in supporting the adoption of circular economies. They can stimulate speedier growth for enterprises that rely on sustainable practices by stipulating legislation and policies in their favor. According to several research findings, subsidies and tax exemption regulations in favor of CE enterprises stimulate increased investment in green production.	(Ikiz Kaya et al., 2021), (Gedam et al., 2021), (Zarbà et al., 2021), (Bilal et al., 2020), (Svensson-Hoglund et al., 2021)
D_4	Supply Chain	The adoption of CE can have a significant impact on supply chain issues. Our findings show that changes in procurement, inventory management, and resource allocation have been among the most researched themes in CE adoption in industrialized countries over the last few years, all of which have positively impacted company revenues.	(Govindan & Hasanagic, 2018), (Del Giudice et al., 2020), (Nandi et al., 2021), (Godinho Filho et al., 2022)
D_5	Customer Value	While production and adequate government and external backing can result in creating green products at reduced prices, consumer perception and attitude toward these products is critical. Marketing and behavioral factors have been used in research findings to persuade consumers to purchase sustainable products.	(van Boerdonk et al., 2021), (Chaudhuri et al., 2022), (Aarikka-Stenroos et al., 2021), (Boyer et al., 2021)
D_6	Stakeholder Preference	The region in which CE entrepreneurship is implemented has a significant impact. According to research, whereas targets are set for long-term achievement in industrialized countries, this focus differs in developing countries. Furthermore, the impact of NGOs and external investors should be addressed as a key factor that varies throughout geographical locations.	(Palafox-Alcantar et al., 2020), (Farooque et al., 2019), (Salvioni & Almici, 2020), (Baah et al., 2022)

D_7	Leadership and Management	Using organizational behaviors and leadership styles as examples, some researchers argue that, similar to strategic planning, which should be educated throughout the organization, adopting CE necessitates extensive knowledge for all employees. They analyze the topic from several perspectives and argue that by implementing these practices, businesses can capitalize on new opportunities while also confronting environmental challenges.	(Zhang et al., 2021), (Hussain & Malik, 2020), (Hofmann & Jaeger-Erben, 2020), (Klein et al., 2022)
D_8	Financial Consideration	As a critical aspect in any firm, CE entrepreneurship is based on financial considerations as well as potential resources on which investors may rely. Scholars have emphasized the function of supportive agents and solutions in assisting investors in effectively managing costs and income, resulting in business expansion through time.	(Rizos et al., 2016), (Ozili, 2021), (Aranda-Usón et al., 2019), (Johl & Toha, 2021), (Mocanu et al., 2022)

In addition to the findings in Table.1 and by evaluating many case studies from Small and medium-sized enterprises (SMEs) (E. A. Khan et al., 2022) and start-ups (Van Opstal & Borms, 2023) on entrepreneurship opportunities and barriers in emerging nations, we already know that investment in emerging nations is benign. This is due to the low costs associated with labour, energy, and manufacturing, which makes these countries a distinctive choice for entrepreneurship (Le et al., 2022). In addition to the costs, the market structure is being changed in these nations, and a recent study (Saura et al., 2022) in hospitality validates people's tendency to preserve the environment by using green technological solutions. However, despite the opportunities arising from the market structure, innovative technologies, and supportive legal and regulatory frameworks that can individually support entrepreneurs to impact developing nations significantly, there is evidence that investment in developing countries is subject to "extra-financial" risks (Kumar et al., 2019). More specifically, stakeholder preferences and regulatory changes, in addition to political and technological uncertainties, are the main reasons that necessitate a deep understanding of which domain to focus on to lower the risk of entrepreneurship.

Over the past ten years, researchers have tackled various challenges and opportunities in adopting the circular economy business model, such as organisational collaboration (Mishra et al., 2019). These studies have shown that the circular economy model can positively impact entrepreneurship in various industries, including fashion (de Aguiar Hugo et al., 2021), agrifood (Mehmood et al., 2021), and construction (Munaro & Tavares, 2023). Moreover, adopting this model can lead to innovative organisational practices (Lehmann et al., 2022). Developed countries with strong economies, such as China (Li et al., 2022), Nordic countries (Hildenbrand et al., 2021), and EU nations (Kumar et al., 2019), have shown promising results for entrepreneurship investment. However, there is a lack of systematic classification for entrepreneurial opportunities in emerging countries that emphasises the importance of the main drivers that encourage circular economy investments.

Therefore, gathering and evaluating these factors methodically and pinpointing critical obstacles is imperative to attain a sustainable strategic plan with greater assurance in the long run. In order to comprehensively comprehend, prioritise, and categorise the execution of the drivers in developing nations, we suggest and apply the fuzzy ISM-MICMAC methodology. Fuzzy

sets have been widely adopted across various fields to enhance the reliability of chronology obtained through this tool. The findings from this methodology assist entrepreneurs in developing nations to address the most pressing issues more efficiently and effectively, thereby ensuring the successful adoption of circular economy principles and practices.

Methodology

In tackling complex problems, ISM-MICMAC has emerged as a leading tool, offering several distinct advantages over comparable methodologies (Jafari-Sadeghi et al., 2021). Research has shown that ISM-MICMAC is versatile and flexible, providing researchers with a comprehensive framework for analysing complex systems and making better decisions. For instance, the methodology was applied to improve supply chain management by identifying the key drivers of supply chains (Shanker & Barve, 2021). Using this tool, Amoozad Mahdiraji et al. (2022) identified critical success factors for entrepreneurship investment in emerging countries. The ISM-MICMAC method has also been implemented in various healthcare (Karamat et al., 2018), human resource management (Sharma, 2022), and sustainability development case studies in emerging nations (Kumar et al., 2020) over the past few years. The general research framework employed in this article is resented in Figure 1.

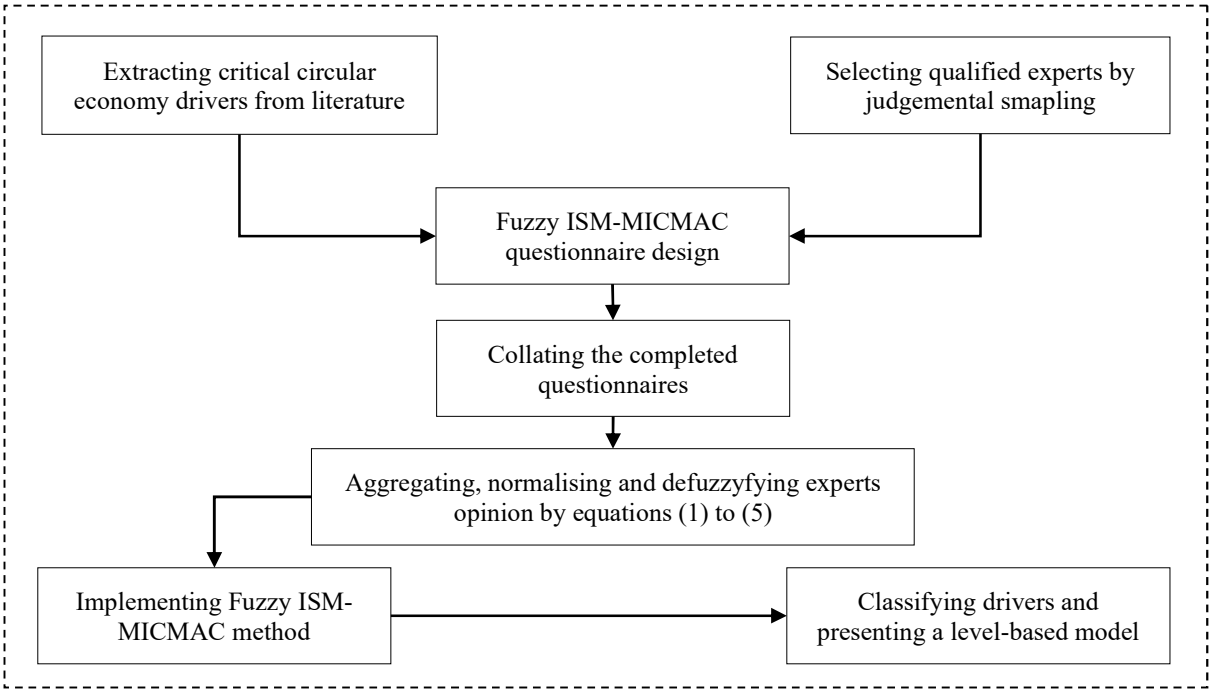

Figure 1. Research Framework (Source: Created by authors)

In this methodology, complex systems are broken down into smaller subsystems. A multilevel structural model enables individuals and groups to understand the relationships that underlie difficult situations (Iqbal et al. 2023). It then uses the experts' practical expertise and knowledge to map the many elements of a given case. By using ISM-MICMAC, it is possible to understand the interaction of each system component within a broader context by breaking it

down into smaller subsystems. The ISM-MICMAC methodology offers a significant benefit in that it enables the examination of both direct and indirect interrelationships between variables, thereby facilitating the analysis of the dynamic impact of various elements (Khaba et al., 2021). Traditional ISM considers only binary digits to indicate whether variables are connected. Consequently, it did not capture the strength of the relationship between the variables. This problem is addressed by the Fuzzy ISM-MICMAC methodology, which involves categorising variables into four distinct categories based on their degree of influence: very weak, weak, strong, and very strong (as presented in Table 2). This approach facilitates a more comprehensive comprehension of the interrelationships between variables. (Wang et al., 2018). A limited amount of research, such as that of Vafadarnikjoo et al. (2020), has been conducted on fuzzy ISM-MICMAC in emerging countries. However, existing studies have demonstrated its potential for analysing complex systems and identifying the most critical factors in various cases.

Table 2. Fuzzy linguistic scale (from Srivastava and Dashora, 2022)

Linguistic Description	Triangular Fuzzy Number	Notation	Influence Scope
No influence	(0.0, 0.0, 0.25)	NO	0
Very low influence	(0.0, 0.25, 0.50)	VL	1
Low influence	(0.25, 0.50, 0.75)	L	2
High influence	(0.50, 0.75, 1.0)	H	3
Very high influence	(0.75, 1.0, 1.0)	VH	4

As suggested by (Srivastava and Dashora, 2022), the following steps are involved in developing this methodology. First, brainstorming and consulting with experts are conducted to identify critical circular economy drivers. This research uses a systematic literature review to extract the list of critical circular economy drivers presented in Table 1. After, the contextual relationships between the relevant elements are evaluated. In this research, as the drivers are qualitative and subjective and limited access is available for numerical data regarding each driver, experts' opinions, intuitions, and experiences have been employed to study the drivers. To identify the experts, some qualifications were considered, including the (i) education level of at least MSc, MA or MBA, (ii) field of study in management, engineering or other social sciences, (iii) age of at least 30 years, (iv) working experience at least five years, (v) managerial experience at least three years in entrepreneurial organisations in the pharmaceutical sector of the emerging economy of Iran, (vi) being a board of directors member, CEO, or senior management team. Considering these qualifications and using judgemental snowball sampling, 15 experts were identified and grouped in three panels. Each panel included one academic member to explain the methodology and guide the panel members on completing the questionnaire. The expert's profile is presented in Table 3.

Table 3. Experts Profile (Source: Created by authors)

Panel	ID	Gender	Area	Age (years)	Experience (years)	Managerial Experience (years)	Managerial position
I	E_1	M	I	40_S	15^+	3^+	SMT

Panel	ID	Gender	Area	Age (years)	Experience (years)	Managerial Experience (years)	Managerial position
	E_2	M	I	50_S	25^+	5^+	SMT
	E_3	F	A	40_S	5^+	-	-
	E_4	F	A&I	60_S	25^+	25^+	BoD
	E_5	F	I	50_S	15^+	3^+	CEO
II	E_6	F	A	40_S	5^+	-	-
	E_7	M	A&I	60_S	35^+	15^+	BoD
	E_8	M	A&I	60_S	35^+	5^+	BoD
	E_9	M	I	50_S	25^+	5^+	CEO
	E_{10}	M	I	50_S	15^+	5^+	CEO
III	E_{11}	M	A&I	50_S	25^+	5^+	BoD
	E_{12}	M	A	40_S	5^+	-	-
	E_{13}	M	A&I	60_S	25^+	5^+	BoD
	E_{14}	M	A	40_S	5^+	-	-
	E_{15}	M	A&I	60_S	35^+	5^+	BoD

I: Industry; A: Academia; M: Male; F: Female; BoD: Board of Directors; CEO: Chief Executive Officer, SMT: Senior Management Team

In each meeting, first, for 30 minutes, the purpose of the research was explained, and the academics presented how to complete the questionnaires. Then, in an average of 120 minutes of a panel discussion, the questionnaire was completed under each panel's academic member's supervision. The critical circular economy drivers are compared pairwise to create a structural self-interaction matrix (SSIM) (Jafari-Sadeghi et al., 2021). Moreover, the intensity of each of the following relations was determined by the linguistic terms mentioned in Table 2.

[1]. In case element (i) leads to element (j), then (V) is used for row (i) column (j) known as a_{ij},
[2]. In case element (j) leads to element (i), then (A) is used for a_{ij},
[3]. In case element (i) leads to element (j) and vice versa, then (X) is used for a_{ij},
[4]. If element (i) does not lead to element (j), and vice versa, then (O) is used for a_{ij}.

Noticeably, fuzzy sets and values were used to consider the uncertainty of the environment and embed the experts' intuition and experience during the evaluation of factors. When the questionnaires were completed by experts and collated by the research team, the linguistic terms were transferred to triangular fuzzy numbers, as shown in Table 2. Then, fuzzy arithmetic means measured the aggregated values for each matrix cell. Eventually, the fuzzy ISM-MICMAC matrix is transferred to a defuzzified (crisp) version by implementing the following steps: First, all cells of the fuzzy reachability matrix are normalised according to the following condition. Where $R = \max r_{ij},\ L = \min l_{ij}\ and\ \Delta = R - LR = \max r_{ij}$.

$$x_{mj} = \frac{m_{ij} - L}{\Delta} \quad (1)$$

$$x_{rj} = \frac{r_{ij} - L}{\Delta} \quad (2)$$

$$x_{ij} = \frac{l_{ij} - L}{\Delta} \quad (3)$$

The normalised values for the left-hand side (LHS) and right-hand side (RHS) were then measured according to the following equations:

$$lhs = \frac{x_{mj}}{1 + x_{mj} - x_{rj}} \quad (4)$$

$$rhs = \frac{x_{rj}}{1 + x_{rj} - x_{mj}} \quad (5)$$

The total normalised crisp value was measured according to $x_j^{crisp} = [lhs(1 - lhs) + lhs * lhs]/[1 - lhs + rhs]$. Finally, the defuzzified/crisp value for each cell of the matrix was calculated via $f_{ij} = L + (x_j^{crisp} * \Delta)$ (Srivastava and Dashora, 2022). Subsequently, the SSIM produces a reachability matrix when (V) and (X) are replaced with (1) and (A), and when (O) is replaced with (0) (Jafari-Sadeghi et al., 2021). Next, transitivity was evaluated. A transitive relationship implies that if A is related to B and B is related to C, then A is related to C. All (0) values were transferred to (1*) when this rule was applied (Jafari-Sadeghi et al., 2021). The next step converts the reachability matrix into a canonical matrix by arranging elements according to their levels. Here, the two indicators known as the driver and dependent power are measured by $\mathrm{DR}\,(\mathrm{i}) = \mathrm{a_{i\cdot}} = \sum_{\mathrm{j}=1}^{\mathrm{n}} \mathrm{a_{ij}}$ and $\mathrm{DE}\,(\mathrm{j}) = a_{\cdot \mathrm{j}} = \sum_{\mathrm{i}=1}^{\mathrm{m}} \mathrm{a_{ij}}$, respectively (Amoozad Mahdiraji et al., 2022). The next stage creates a directed graph based on relationships within the reachability matrix. An ISM is created by removing transitive links and replacing enablers with statement nodes by considering the following rules (Jafari-Sadeghi et al. 2021).

[1]. Define the reachability (output) set for element (i), which encompasses the list of elements affected by element (i) (i.e., elements that have value (1) in the i^{th} row).
[2]. Define the antecedent (input) set for element (i), which embraces the list of factors that have an impact on element (i) (i.e., elements that have value (1) in the j^{th} column).
[3]. Define the intersection (common) set for element (i), which is reachable and antecedent.
[4]. If the intersection and antecedent sets are the same for a specific element, it is selected as a high-level element and eliminated from Final Reachability Matrix (FRM).

The above steps are repeated until all the elements are levelled. According to the MICMAC, variables can be classified into four categories: (i) autonomous variables, (ii) dependent variables, (iii) linkage variables, and (iv) independent variables. Variables with autonomy have low driving power and low dependence, meaning that they are influenced by other variables but have little influence on them. Dependent variables have a high degree of dependence but low driving power, meaning that they are heavily influenced by other variables but have little effect on them. A high degree of dependence and driving power indicate that the linkage variables are strongly influenced by and strongly influenced by other variables. An independent

variable has high driving power but low dependence, meaning that it is significantly influenced by other variables but not significantly influenced by them (Gorane and Kant, 2013).

Findings

As previously discussed, the initial findings reflect the viewpoint of the expert panel. An online session was conducted during this investigation. In this session, a cohort of Iranian academic and industry professionals is briefed on the drivers of CE entrepreneurship in emerging countries. Subsequently, they were asked to respond to the questionnaires based on Fuzzy logic. Given academics' close relationship with the industrial sector in today's business landscape, combining academics with industry professionals was deliberate. At least three active members from the academic and industrial sectors were involved in each panel. All were over 30 years old, had more than five years of managerial experience in entrepreneurial organisations, and had at least a bachelor's degree in engineering or management. These experts participated in three hours meetings. First, an academic described the research objectives and how to complete the questionnaires in 30 minutes. Subsequently, in each panel, experts discussed and completed the ISM-MICMAC questionnaires using linguistic terms, as presented in Table 2. Table 4 shows the arithmetic mean of their fuzzy opinions that were aggregated.

Table 4. Fuzzy aggregated ISM matrix (Source: Created by authors)

	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8
D_1	(0,0,0.25)	(0.5,0.75,0.917)	(0.583,0.833,0.917)	(0.583,0.833,1)	(0.417,0.667,0.833)	(0.333,0.5,0.75)	(0,0.083,0.333)	(0.583,0.833,1)
D_2	(0.417,0.667,0.917)	(0,0,0.25)	(0.083,0.25,0.5)	(0.333,0.583,0.833)	(0.333,0.583,0.75)	(0,0.167,0.417)	(0.417,0.667,0.833)	(0.417,0.667,0.917)
D_3	(0.5,0.75,0.917)	(0.25,0.5,0.75)	(0,0,0.25)	(0.167,0.25,0.5)	(0,0.167,0.417)	(0.417,0.667,0.833)	(0.5,0.667,0.75)	(0.667,0.917,1)
D_4	(0.417,0.667,0.917)	(0.333,0.583,0.833)	(0.167,0.417,0.667)	(0,0,0.25)	(0.417,0.667,0.917)	(0.167,0.333,0.583)	(0,0.167,0.417)	(0.333,0.583,0.833)
D_5	(0.417,0.667,0.833)	(0.25,0.5,0.75)	(0.25,0.5,0.75)	(0.167,0.333,0.583)	(0,0,0.25)	(0.75,1,1)	(0.417,0.667,0.833)	(0.5,0.75,0.833)
D_6	(0.25,0.5,0.75)	(0.25,0.5,0.75)	(0.25,0.5,0.75)	(0.167,0.417,0.667)	(0.5,0.75,1)	(0,0,0.25)	(0.5,0.75,0.917)	(0.417,0.667,0.833)
D_7	(0.083,0.333,0.583)	(0.25,0.417,0.667)	(0.417,0.667,0.833)	(0.167,0.417,0.667)	(0.333,0.583,0.833)	(0.417,0.667,0.917)	(0,0,0.25)	(0.417,0.667,0.917)
D_8	(0.417,0.667,0.833)	(0.417,0.667,0.833)	(0.417,0.667,0.917)	(0.25,0.5,0.75)	(0.333,0.583,0.833)	(0.417,0.667,0.917)	(0.333,0.583,0.833)	(0,0,0.25)

Next, based on the normalisation and defuzzification equations suggested by (Srivastava and Dashora, 2022), the table was transformed to the crisp values, shown in Table 5a.

Table 5a. De-Fuzzy (crisp) aggregated ISM matrix (Source: Created by authors)

	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8
D_1	0.083	0.722	0.778	0.806	0.639	0.528	0.139	0.806
D_2	0.667	0.083	0.278	0.583	0.556	0.194	0.639	0.667
D_3	0.722	0.500	0.083	0.306	0.194	0.639	0.639	0.861
D_4	0.667	0.583	0.417	0.083	0.667	0.361	0.194	0.583
D_5	0.639	0.500	0.500	0.361	0.083	0.917	0.639	0.694
D_6	0.500	0.500	0.500	0.417	0.750	0.083	0.722	0.639
D_7	0.333	0.444	0.639	0.417	0.583	0.667	0.083	0.667

	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8
D_8	0.639	0.639	0.667	0.500	0.583	0.667	0.583	0.083

The interactive matrix is then transformed to a zero and one matrix, as shown in Table 5b, to construct the reachability matrix for further calculations. The transitivity test is performed at this stage, and the final reachability matrix is constructed using the previously mentioned rules. Furthermore, the driver-dependent power map is calculated and displayed based on a study by (Jafari-Sadeghi et al., 2021). It should be noted that the dependent power DR(j) refers to the power map of the eight factors, whereas the driver's power DR(i) shows the driver power of each factor.

Table 5b. Final Reachability Matrix and DDPM (Source: Created by authors)

	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	Driving power
D_1	1^*	1	1	1	1^*	1^*	0	1	7
D_2	1	1^*	1^*	1^*	0	1^*	0	1	6
D_3	1	1^*	1^*	1^*	0	1^*	0	1	6
D_4	1	1^*	1^*	1^*	1	1^*	0	1^*	7
D_5	0	0	1^*	0	1^*	1	1^*	1	5
D_6	0	0	0	0	1	1^*	1	1^*	4
D_7	0	0	1^*	0	1^*	1	1^*	1	5
D_8	1^*	0	1	0	1^*	1	1^*	1^*	6
Dependence Power	5	4	7	4	6	8	4	8	

The MATLAB code calculates the reachability and antecedents of all factors and their intersections at this point. Table 6 depicts the procedure for determining the level-based conceptual model, which assigns the first level to factors whose reachability set values equal the intersections. Therefore, D_6 and D_8 are selected as the first level in this case. In round two, after removing rows D_6 and D_8, the loop is repeated to calculate level two. Technological advancements (D_2) and legal and regulatory factors (D_3) were selected for level two and removed from the matrix. In the third round, D_5 and D_7 were selected by repeating this method. Consequently, D_1 and D_4 were allocated to level 4.

Table 6. Level-Based factor determination for ISM (Source: Created by authors)

Criteria	Reachability set	Antecedent set	Intersection set	Level
		Round 1		
D_1	D_1-D_2-D_3-D_4-D_5-D_6-D_8	D_1-D_2-D_3-D_4-D_8	D_1-D_2-D_3-D_4-D_8	
D_2	D_1-D_2-D_3-D_4-D_6-D_8	D_1-D_2-D_3-D_4	D_1-D_2-D_3-D_4	
D_3	D_1-D_2-D_3-D_4-D_6-D_8	D_1-D_2-D_3-D_4-D_5-D_7-D_8	D_1-D_2-D_3-D_4-D_8	
D_4	D_1-D_2-D_3-D_4-D_5-D_6-D_8	D_1-D_2-D_3-D_4	D_1-D_2-D_3-D_4	
D_5	D_3-D_5-D_6-D_7-D_8	D_1-D_4-D_5-D_6-D_7-D_8	D_5-D_6-D_7-D_8	
D_6	D_5-D_6-D_7-D_8	D_1-D_2-D_3-D_4-D_5-D_6-D_7-D_8	D_5-D_6-D_7-D_8	1
D_7	D_3-D_5-D_6-D_7-D_8	D_5-D_6-D_7-D_8	D_5-D_6-D_7-D_8	
D_8	D_1-D_3-D_5-D_6-D_7-D_8	D_1-D_2-D_3-D_4-D_5-D_6-D_7-D_8	D_1-D_3-D_5-D_6-D_7-D_8	1

Criteria	Reachability set	Antecedent set	Intersection set	Level
		Round 2		
D_1	D_1-D_2-D_3-D_4-D_5	D_1-D_2-D_3-D_4	D_1-D_2-D_3-D_4	
D_2	D_1-D_2-D_3-D_4	D_1-D_2-D_3-D_4	D_1-D_2-D_3-D_4	2
D_3	D_1-D_2-D_3-D_4	D_1-D_2-D_3-D_4-D_5-D_7	D_1-D_2-D_3-D_4	2
D_4	D_1-D_2-D_3-D_4-D_5	D_1-D_2-D_3-D_4	D_1-D_2-D_3-D_4	
D_5	D_3-D_5-D_7	D_1-D_4-D_5-D_7	D_5-D_7	
D_7	D_3-D_5-D_7	D_5-D_7	D_5-D_7	
		Round 3		
D_1	D_1-D_4-D_5	D_1-D_4	D_1-D_4	
D_4	D_1-D_4-D_5	D_1-D_4	D_1-D_4	
D_5	D_5-D_7	D_1-D_4-D_5-D_7	D_5-D_7	3
D_7	D_5-D_7	D_5-D_7	D_5-D_7	3
		Round 4		
D_1	D_1-D_4	D_1-D_4	D_1-D_4	4
D_4	D_1-D_4	D_1-D_4	D_1-D_4	4

Finally, a stage-based conceptual model is designed, as shown in Figure 2. This model was designed based on factor levels and showed a within-level relationship between the factors.

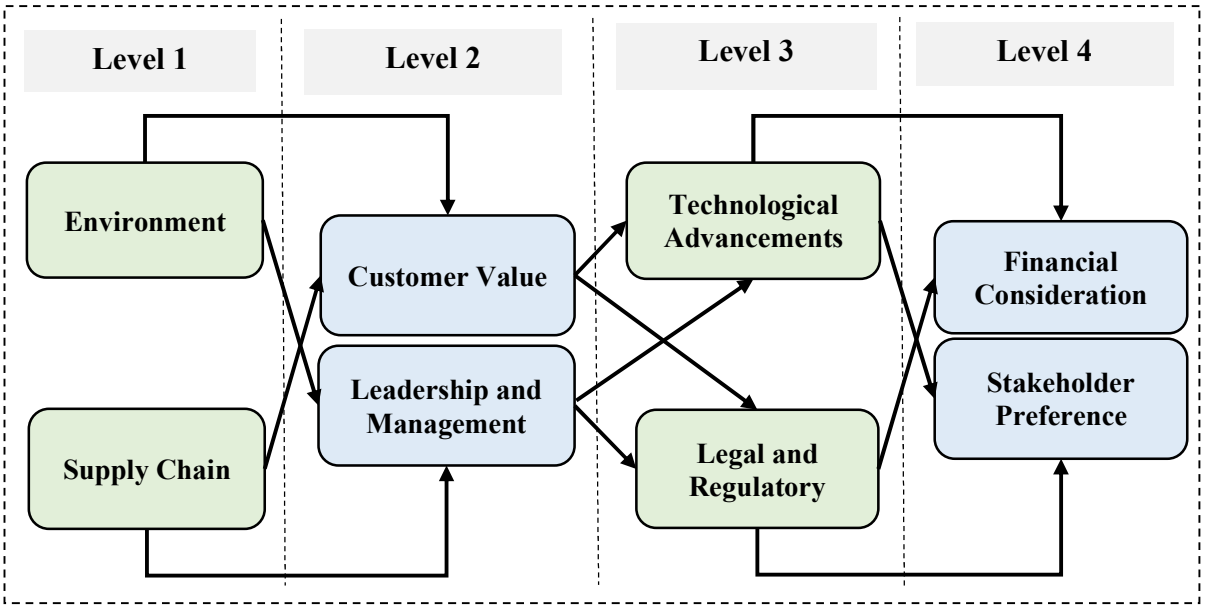

Figure 2. CE entrepreneurial factors relation based on ISM level-based model (Source: Created by authors)

A comprehensive map was developed based on the relationships between interdependence and influence of various factors. This map identifies distinct areas that drive circular economy entrepreneurship in emerging countries. The map divides these factors into four categories, as shown in Figure 3. Stakeholder preferences are highly dependent, but have little driving power. On the other hand, the independent variables - technological advancement, supply chain, leadership, and management - have high driving power but low dependence, indicating that they can influence other variables without being influenced.

In developing countries, such as Iran, stakeholder preferences significantly influence circular economy adoption (Jokar et al., 2021). The government, non-governmental organisations, and business leaders can encourage eco-friendly business models by enacting policies and providing incentives to encourage sustainable practices. The varying stakeholder preferences of emerging countries make understanding their context and dynamics essential for developing effective circular economy strategies.

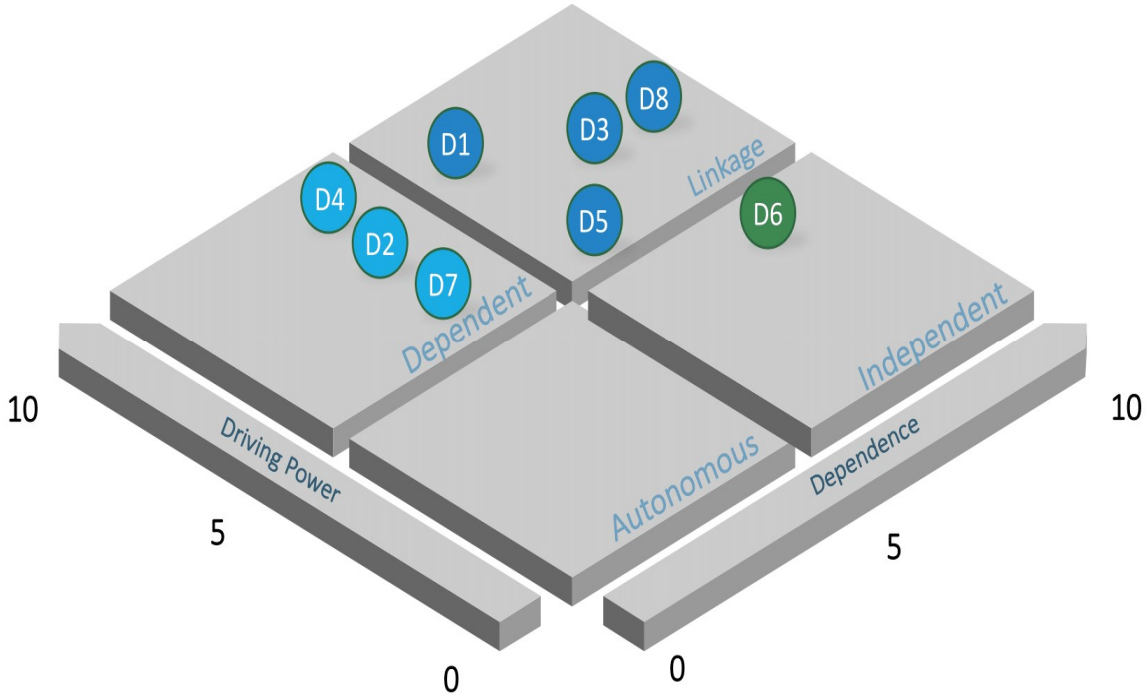

Figure 3. MICMAC Classification Results (Source: Created by authors)

The adoption and success of circular business models in developing countries are influenced by technological advancements, supply chains, leadership, and management. Supply chain entrepreneurship is one of the primary drivers of a circular economy. As part of the ISM MICMAC methodology, we identified significant linkage variables, including the environment, legal and regulatory frameworks, customer values, and financial factors. A high degree of dependence and driving power indicate that these variables can influence and be influenced by other variables.

Circular economic practices are influenced by environmental factors such as climate change and resource depletion in developing countries. By reducing the ecological impact of industrial activities, business models can help businesses meet their sustainability commitments (Hysa et al., 2020). Legal and regulatory frameworks can also influence firms' adoption of sustainable practices. It can drive circular business models by creating a demand for sustainable and

responsible practices. Financial incentives can also be significant for encouraging businesses to adopt sustainable practices. In business models, companies can save money and increase profits by focusing on resource efficiency and waste reduction.

Discussion and implications

Theoretical implications

This research has broad implications for entrepreneurial and management literature. Although the transition to sustainabile production is gaining a major interest across disciplines, existing literature still mostly focuses on developing nations, such as EU countries (e.g., Pîrvu et al. 2019). Thus, this study broadens the existing literature on circular business model transitions (for example, Veleva & Bodkin, 2018; Hina et al. 2022; Wrålsen et al., 2021) by adding the perceptions of entrepreneurs in developing countries. The results also show that the drivers of entrepreneurs in developing countries pursuing circular business models differ from those of developed ones. In particular, for developing countries, environmental and supply chain drivers appeared to have the highest importance, whereas, for developed countries, the importance of legislative policies and financial factors was underlined (Wrålsen et al. 2021). Stakeholder pressure, on the other hand, appears to be less relevant for developing countries than for developed countries (Hina et al. 2022).

Additionally, the theoretical foundations were extended by interactions between specific drivers. Thus, although the literature often puts management skills close to internal technological development (Suchek et al. 2021), linkages of lower strength but higher driving power were found in this research.

This research also contributes to the methodology by showing an additional use case for the Fuzzy-ISM MICMAC technique. Scholars and policymakers can improve resource utilisation and build efficient circular economy policies by incorporating linear optimisation approaches into future investigations that consider emerging countries' unique contextual characteristics. Using the fuzzy ISM-MICMAC, this study discovered and effectively classified the primary determinants encouraging entrepreneurship in developing nations. Scholars are encouraged to delve deeper into this issue using more advanced approaches. Combine the ISM MICMAC with Interval-Valued Intuitionistic Fuzzy (IVIF), hesitant fuzzy numbers, or Fermetean number sets for even more dependable results. Furthermore, future research could apply this problem in conjunction with structural equation modelling (SEM) or the principal component analysis (PCA) technique to investigate additional elements of CE in developing nations.

Practical Implications

This study emphasises the importance of financial considerations for supporting circular entrepreneurship in emerging countries. However, initial investment costs may prevent some businesses from adopting circular business models, which can result in long-term savings and increased profitability. Circular entrepreneurship requires further research into its financial implications to overcome initial investment costs. In addition, this research shows the importance of top management skills and technology availability, which lie at the bottom of the

circular business model transition. Thus, before the transition occurs, managers need to invest in research and development to reach a high level of technology development, as well as develop leadership and management skills.

Various factors contribute to the dynamics of a circular economy in developing nations. These factors include sanctions, low labour costs, and energy prices, which are relatively lower than those in EU countries. Understanding these limitations and possibilities will facilitate policymaking in developing countries. This yields a more nuanced understanding of the complexities of implementing circular economic practices in emerging economies. Considering the importance of reaching the Sustainable Development Goals (SDGs) underlined by the United Nations and the appearance of regional strategies based on circular economies (Haleem et al., 2021), it is especially important for policymakers worldwide to promote SDGs in developing countries. This study shows that cohesive legislation and subsidies for entrepreneurs may be an important driver for them to switch to circular business models. Moreover, these factors appear to be highly connected with other drivers, putting them at the centre of the framework.

Conclusion

The transition to a circular economy is becoming an increasingly important topic across multiple disciplines. Despite this, more research is needed to focus on developing countries' perspectives on the shift to circular business models. This study contributes new insights into the perceptions of entrepreneurs in developing countries and extends the existing literature on business models. Our research reveals that the drivers of circular business models differ between industrialised and developing countries. Environmental and supply chain factors are more significant for developing countries, while industrialised countries prioritise legislative and financial policies. Our study also highlights the importance of stakeholder engagement, which is less prevalent in developing countries than in industrialised ones.
Furthermore, by utilising Fuzzy ISM-MICMAC, our research contributes to the theoretical basis for transitioning to a circular business model by identifying specific drivers and their interactions. This study demonstrates that management skills and internal technological development have high driving power, even though they have lower strength. These findings provide insights for policymakers and business leaders seeking to promote sustainable practices and circular business models in developing countries.

Limitations and avenues for further research

As with any empirical study, the research under consideration has some limitations. Scholars are advised to promote circular economy practices in emerging countries using a multi-stakeholder approach, as suggested by Pereno and Eriksson (2020), to gain a more comprehensive understanding of the role of such a driver in adopting circular economies in emerging countries, since stakeholder scope was limited in this study. Many stakeholders, including government bodies, non-governmental organisations, business leaders, investors, and consumers, must be involved in fostering circular entrepreneurship. Therefore, additional

research is required to understand their perspectives and motivations better. This study suggests that emerging countries should encourage circular entrepreneurship through context-specific measures. The circular economy identified in this study may have varying degrees of relevance and significance across different countries and regions. For instance, nations with abundant natural resources and proximity to supply chain partners may benefit from supply chain drivers. However, countries with advanced technological development may have a more profound impact. Thus, there is a need to conduct research in various regions and countries to promote circular entrepreneurship.

This study emphasises the importance of financial considerations for supporting circular entrepreneurship in emerging countries. However, initial investment costs may prevent some businesses from adopting circular business models, which can result in long-term savings and increased profitability. CE entrepreneurship requires further research into its financial implications to overcome initial investment costs. Various factors contribute to the dynamics of a circular economy in developing nations. These factors include sanctions, low labour costs, and energy prices, which are relatively lower than those in EU countries. Understanding these limitations and possibilities will facilitate the exploration of new research avenues. This yields a more nuanced understanding of the complexities of implementing circular economic practices in emerging economies.

Bibliography

Al-Awlaqi, M. A., & Aamer, A. M. (2022, December). Individual entrepreneurial factors affecting adoption of circular business models: An empirical study on small businesses in a highly resource-constrained economy. *Journal of Cleaner Production*, *379*, 134736. https://doi.org/10.1016/j.jclepro.2022.134736

Aarikka-Stenroos, L., Welathanthri, M. D., & Ranta, V. (2021, December 13). What Is the Customer Value of the Circular Economy? Cross-Industry Exploration of Diverse Values Perceived by Consumers and Business Customers. *Sustainability*, *13*(24), 13764. https://doi.org/10.3390/su132413764

Abad-Segura, E., Fuente, A. B. D. L., González-Zamar, M. D., & Belmonte-Ureña, L. J. (2020, July 18). Effects of Circular Economy Policies on the Environment and Sustainable Growth: Worldwide Research. *Sustainability*, *12*(14), 5792. https://doi.org/10.3390/su12145792

Agyemang, M., Kusi-Sarpong, S., Khan, S. A., Mani, V., Rehman, S. T., & Kusi-Sarpong, H. (2019, April 18). Drivers and barriers to circular economy implementation. *Management Decision*, *57*(4), 971–994. https://doi.org/10.1108/md-11-2018-1178

Amoozad Mahdiraji, H., Beheshti, M., Razavi Hajiagha, S. H., Ahmadzadeh Kandi, N., & Boudlaie, H. (2021, October 29). A process-based guide for international entrepreneurs while investing in the agrifood sector of an emerging economy: a multi-layer decision-making approach. *British Food Journal*, *124*(7), 1984–2011. https://doi.org/10.1108/bfj-08-2021-0876

Aranda-Usón, A., Portillo-Tarragona, P., Marín-Vinuesa, L., & Scarpellini, S. (2019, February 8). Financial Resources for the Circular Economy: A Perspective from Businesses. *Sustainability*, *11*(3), 888. https://doi.org/10.3390/su11030888

Baah, C., Afum, E., Agyabeng-Mensah, Y., & Agyeman, D. O. (2021, July 17). Stakeholder Influence on Adoption of Circular Economy Principles: Measuring Implications for Satisfaction and Green Legitimacy. *Circular Economy and Sustainability*, *2*(1), 91–111. https://doi.org/10.1007/s43615-021-00093-2

Babatunde, S., El-Gohary, H., & Edwards, D. (2021, March 9). Assessment methods in entrepreneurship education, challenges and opportunities in developed and developing nations: a comparative study of Nigeria and England. *Education + Training*, *63*(7/8), 1092–1113. https://doi.org/10.1108/et-12-2020-0368

Barros, M. V., Salvador, R., do Prado, G. F., de Francisco, A. C., & Piekarski, C. M. (2021, June). Circular economy as a driver to sustainable businesses. *Cleaner Environmental Systems*, *2*, 100006. https://doi.org/10.1016/j.cesys.2020.100006

Bilal, M., Khan, K. I. A., Thaheem, M. J., & Nasir, A. R. (2020, December). Current state and barriers to the circular economy in the building sector: Towards a mitigation framework. *Journal of Cleaner Production*, *276*, 123250. https://doi.org/10.1016/j.jclepro.2020.123250

Bist, N., Sircar, A., & Yadav, K. (2020, November). Holistic review of hybrid renewable energy in circular economy for valorization and management. *Environmental Technology & Innovation*, *20*, 101054. https://doi.org/10.1016/j.eti.2020.101054

Boyer, R. H. W., Hunka, A. D., & Whalen, K. A. (2021, November 9). Consumer Demand for Circular Products: Identifying Customer Segments in the Circular Economy. *Sustainability*, *13*(22), 12348. https://doi.org/10.3390/su132212348

Buch, R., Marseille, A., Williams, M., Aggarwal, R., & Sharma, A. (2021, August 10). From Waste Pickers to Producers: An Inclusive Circular Economy Solution through Development of Cooperatives in Waste Management. *Sustainability*, *13*(16), 8925. https://doi.org/10.3390/su13168925

Cagno, E., Neri, A., Negri, M., Bassani, C. A., & Lampertico, T. (2021, April 7). The Role of Digital Technologies in Operationalizing the Circular Economy Transition: A Systematic Literature Review. *Applied Sciences*, *11*(8), 3328. https://doi.org/10.3390/app11083328

Cezarino, L. O., Liboni, L. B., Oliveira Stefanelli, N., Oliveira, B. G., & Stocco, L. C. (2019, May 8). Diving into emerging economies bottleneck: Industry 4.0 and implications for circular economy. *Management Decision*, *59*(8), 1841–1862. https://doi.org/10.1108/md-10-2018-1084
Chamberlin, L., & Boks, C. (2018, June 19). Marketing Approaches for a Circular Economy: Using Design Frameworks to Interpret Online Communications. *Sustainability*, *10*(6), 2070. https://doi.org/10.3390/su10062070
Chase. (2023). *Longchain* . https://python.langchain.com/en/latest/index.html. Retrieved May 24, 2023, from https://python.langchain.com/en/latest/index.html
Chau, M. Q., Nguyen, X. P., Huynh, T. T., Chu, V. D., Le, T. H., Nguyen, T. P., & Nguyen, D. T. (2021, October 30). Prospects of application of IoT-based advanced technologies in remanufacturing process towards sustainable development and energy-efficient use. *Energy Sources, Part A: Recovery, Utilization, and Environmental Effects*, 1–25. https://doi.org/10.1080/15567036.2021.1994057
Chaudhuri, A., Subramanian, N., & Dora, M. (2022, March). Circular economy and digital capabilities of SMEs for providing value to customers: Combined resource-based view and ambidexterity perspective. *Journal of Business Research*, *142*, 32–44. https://doi.org/10.1016/j.jbusres.2021.12.039
Chen, W. M., & Kim, H. (2019, May 27). Circular economy and energy transition: A nexus focusing on the non-energy use of fuels. *Energy & Environment*, *30*(4), 586–600. https://doi.org/10.1177/0958305x19845759
Chiappetta Jabbour, C. J., Seuring, S., Lopes de Sousa Jabbour, A. B., Jugend, D., De Camargo Fiorini, P., Latan, H., & Izeppi, W. C. (2020, June). Stakeholders, innovative business models for the circular economy and sustainable performance of firms in an emerging economy facing institutional voids. *Journal of Environmental Management*, *264*, 110416. https://doi.org/10.1016/j.jenvman.2020.110416
Chowdhury, R. H., & Maung, M. (2020, March 18). Accessibility to external finance and entrepreneurship: A cross-country analysis from the informal institutional perspective. *Journal of Small Business Management*, *60*(3), 668–703. https://doi.org/10.1080/00472778.2020.1726125
Cullen, U. A., & De Angelis, R. (2021, May). Circular entrepreneurship: A business model perspective. *Resources, Conservation and Recycling*, *168*, 105300. https://doi.org/10.1016/j.resconrec.2020.105300
Del Giudice, M., Chierici, R., Mazzucchelli, A., & Fiano, F. (2020, September 3). Supply chain management in the era of circular economy: the moderating effect of big data. *The International Journal of Logistics Management*, *32*(2), 337–356. https://doi.org/10.1108/ijlm-03-2020-0119
de Aguiar Hugo, A., de Nadae, J., & da Silva Lima, R. (2021, November 5). Can Fashion Be Circular? A Literature Review on Circular Economy Barriers, Drivers, and Practices in the Fashion Industry's Productive Chain. *Sustainability*, *13*(21), 12246. https://doi.org/10.3390/su132112246
Devkota, N., Shreebastab, D. K., Korpysa, J., Bhattarai, K., & Paudel, U. R. (2022, March 30). Determinants of successful entrepreneurship in a developing nation: Empirical evaluation using an ordered logit model. *JOURNAL OF INTERNATIONAL STUDIES*, *15*(1), 181–196. https://doi.org/10.14254/2071-8330.2022/15-1/12
Dzogbenuku, R. K., & Keelson, S. A. (2019, September 2). Marketing and entrepreneurial success in emerging markets: the nexus. *Asia Pacific Journal of Innovation and Entrepreneurship*, *13*(2), 168–187. https://doi.org/10.1108/apjie-12-2018-0072
Elf, P., Werner, A., & Black, S. (2022, February 4). Advancing the circular economy through dynamic capabilities and extended customer engagement: Insights from small sustainable fashion enterprises in the UK. *Business Strategy and the Environment*, *31*(6), 2682–2699. https://doi.org/10.1002/bse.2999
Farooque, M., Zhang, A., & Liu, Y. (2019, August 19). Barriers to circular food supply chains in China. *Supply Chain Management: An International Journal*, *24*(5), 677–696. https://doi.org/10.1108/scm-10-2018-0345
Ferronato, N., Rada, E. C., Gorritty Portillo, M. A., Cioca, L. I., Ragazzi, M., & Torretta, V. (2019, January). Introduction of the circular economy within developing regions: A comparative analysis of advantages

and opportunities for waste valorization. *Journal of Environmental Management*, *230*, 366–378. https://doi.org/10.1016/j.jenvman.2018.09.095
Foroozanfar, M. H., Imanipour, N., & Sajadi, S. M. (2022, July 5). Integrating circular economy strategies and business models: a systematic literature review. *Journal of Entrepreneurship in Emerging Economies*, *14*(5), 678–700. https://doi.org/10.1108/jeee-10-2021-0411
Garcés-Ayerbe, C., Rivera-Torres, P., Suárez-Perales, I., & Leyva-de la Hiz, D. (2019, March 8). Is It Possible to Change from a Linear to a Circular Economy? An Overview of Opportunities and Barriers for European Small and Medium-Sized Enterprise Companies. *International Journal of Environmental Research and Public Health*, *16*(5), 851. https://doi.org/10.3390/ijerph16050851
Gedam, V. V., Raut, R. D., Lopes de Sousa Jabbour, A. B., Tanksale, A. N., & Narkhede, B. E. (2021, August). Circular economy practices in a developing economy: Barriers to be defeated. *Journal of Cleaner Production*, *311*, 127670. https://doi.org/10.1016/j.jclepro.2021.127670
Godinho Filho, M., Monteiro, L., de Oliveira Mota, R., dos Santos Leite Gonella, J., & de Souza Campos, L. M. (2022, February 26). The Relationship between Circular Economy, Industry 4.0 and Supply Chain Performance: A Combined ISM/Fuzzy MICMAC Approach. *Sustainability*, *14*(5), 2772. https://doi.org/10.3390/su14052772
Gorane, S., & Kant, R. (2013). Supply chain management: modelling the enablers using ISM and fuzzy MICMAC approach. *International Journal of Logistics Systems and Management*, *16*(2), 147. https://doi.org/10.1504/ijlsm.2013.056158
Govindan, K., & Hasanagic, M. (2018, January 3). A systematic review on drivers, barriers, and practices towards circular economy: a supply chain perspective. *International Journal of Production Research*, *56*(1–2), 278–311. https://doi.org/10.1080/00207543.2017.1402141
Gue, I. H. V., Promentilla, M. A. B., Tan, R. R., & Ubando, A. T. (2020, December). Sector perception of circular economy driver interrelationships. *Journal of Cleaner Production*, *276*, 123204. https://doi.org/10.1016/j.jclepro.2020.123204
Guldmann, E., & Huulgaard, R. D. (2020, January). Barriers to circular business model innovation: A multiple-case study. *Journal of Cleaner Production*, *243*, 118160. https://doi.org/10.1016/j.jclepro.2019.118160
Gusmerotti, N. M., Testa, F., Corsini, F., Pretner, G., & Iraldo, F. (2019, September). Drivers and approaches to the circular economy in manufacturing firms. *Journal of Cleaner Production*, *230*, 314–327. https://doi.org/10.1016/j.jclepro.2019.05.044
Haleem, A., Khan, S., Pundir, H., Jain, A., Upadhyay, P., & Khan, M. I. (2020, October 8). Investigating Barriers Toward the Implementation of Circular Economy: A Fuzzy CRITIC Approach. *Journal of Industrial Integration and Management*, *06*(01), 107–139. https://doi.org/10.1142/s2424862220500177
Hildenbrand, J., Dahlström, J., Shahbazi, S., & Kurdve, M. (2021, November 12). Identifying and Evaluating Recirculation Strategies for Industry in the Nordic Countries. *Recycling*, *6*(4), 74. https://doi.org/10.3390/recycling6040074
Hina, M., Chauhan, C., Kaur, P., Kraus, S., & Dhir, A. (2022, January). Drivers and barriers of circular economy business models: Where we are now, and where we are heading. *Journal of Cleaner Production*, *333*, 130049. https://doi.org/10.1016/j.jclepro.2021.130049
Hofmann, F., & Jaeger-Erben, M. (2020, August 2). Organizational transition management of circular business model innovations. *Business Strategy and the Environment*, *29*(6), 2770–2788. https://doi.org/10.1002/bse.2542
Hussain, M., & Malik, M. (2020, May). Organizational enablers for circular economy in the context of sustainable supply chain management. *Journal of Cleaner Production*, *256*, 120375. https://doi.org/10.1016/j.jclepro.2020.120375

Huynh, P. H. (2021, June 8). “Enabling circular business models in the fashion industry: the role of digital innovation.” *International Journal of Productivity and Performance Management*, *71*(3), 870–895. https://doi.org/10.1108/ijppm-12-2020-0683
Huysveld, S., Hubo, S., Ragaert, K., & Dewulf, J. (2019, February). Advancing circular economy benefit indicators and application on open-loop recycling of mixed and contaminated plastic waste fractions. *Journal of Cleaner Production*, *211*, 1–13. https://doi.org/10.1016/j.jclepro.2018.11.110
Hysa, E., Kruja, A., Rehman, N. U., & Laurenti, R. (2020, June 12). Circular Economy Innovation and Environmental Sustainability Impact on Economic Growth: An Integrated Model for Sustainable Development. *Sustainability*, *12*(12), 4831. https://doi.org/10.3390/su12124831
Ikiz Kaya, D., Pintossi, N., & Dane, G. (2021, February 25). An Empirical Analysis of Driving Factors and Policy Enablers of Heritage Adaptive Reuse within the Circular Economy Framework. *Sustainability*, *13*(5), 2479. https://doi.org/10.3390/su13052479
Ilić, M. P., Ranković, M., Dobrilović, M., Bucea-Manea-Țoniş, R., Mihoreanu, L., Gheța, M. I., & Simion, V. E. (2022, January 9). Challenging Novelties within the Circular Economy Concept under the Digital Transformation of Society. *Sustainability*, *14*(2), 702. https://doi.org/10.3390/su14020702
Iqbal, M., Ma, J., Ahmad, N., Ullah, Z., & Hassan, A. (2022, February 20). Energy-Efficient supply chains in construction industry: An analysis of critical success factors using ISM-MICMAC approach. *International Journal of Green Energy*, *20*(3), 265–283. https://doi.org/10.1080/15435075.2022.2038609
Jafari-Sadeghi, V., Amoozad Mahdiraji, H., Bresciani, S., & Pellicelli, A. C. (2021, September). Context-specific micro-foundations and successful SME internationalisation in emerging markets: A mixed-method analysis of managerial resources and dynamic capabilities. *Journal of Business Research*, *134*, 352–364. https://doi.org/10.1016/j.jbusres.2021.05.027
Joensuu, T., Edelman, H., & Saari, A. (2020, December). Circular economy practices in the built environment. *Journal of Cleaner Production*, *276*, 124215. https://doi.org/10.1016/j.jclepro.2020.124215
Johl, S. K., & Toha, M. A. (2021, June 1). The Nexus between Proactive Eco-Innovation and Firm Financial Performance: A Circular Economy Perspective. *Sustainability*, *13*(11), 6253. https://doi.org/10.3390/su13116253
Jokar, D., Khakzand, M., & Faizi, M. (2021, October). The application of low impact development approaches toward achieving circularity in the water sector: A case study from Soltan Abad, shiraz, Iran. *Journal of Cleaner Production*, *320*, 128712. https://doi.org/10.1016/j.jclepro.2021.128712
Karamat, J., Shurong, T., Ahmad, N., Waheed, A., & Khan, S. (2018, November 12). Barriers to Knowledge Management in the Health Sector of Pakistan. *Sustainability*, *10*(11), 4155. https://doi.org/10.3390/su10114155
Kasmi, F., Osorio, F., Dupont, L., Marche, B., & Camargo, M. (2022, August 30). Innovation Spaces as Drivers of Eco-innovations Supporting the Circular Economy: A Systematic Literature Review. *Journal of Innovation Economics & Management*, *N° 39*(3), 173–214. https://doi.org/10.3917/jie.pr1.0113
Katika, T., Karaseitanidis, I., Tsiakou, D., Makropoulos, C., & Amditis, A. (2022, February 3). Augmented Reality (AR) Supporting Citizen Engagement in Circular Economy. *Circular Economy and Sustainability*, *2*(3), 1077–1104. https://doi.org/10.1007/s43615-021-00137-7
Kayikci, Y., Kazancoglu, Y., Gozacan-Chase, N., Lafci, C., & Batista, L. (2022, October). Assessing smart circular supply chain readiness and maturity level of small and medium-sized enterprises. *Journal of Business Research*, *149*, 375–392. https://doi.org/10.1016/j.jbusres.2022.05.042
Khaba, S., Bhar, C., & Ray, A. (2020, December 9). A study on key lean enablers of the coal mining sector using ISM, MICMAC and SEM. *The TQM Journal*, *33*(6), 1281–1305. https://doi.org/10.1108/tqm-04-2020-0069

Khan, E. A., Chowdhury, M. M. H., Hossain, M. A., Mahmud, A. S., Baabdullah, A. M., & Dwivedi, Y. K. (2022, October 12). Performance of small firms in a circular economy: configuring challenges and entrepreneurial orientation. *Management Decision*. https://doi.org/10.1108/md-05-2022-0731

Khan, W., Nisar, Q. A., Roomi, M. A., Nasir, S., Awan, U., & Rafiq, M. (2023, March 22). Green human resources management, green innovation and circular economy performance: the role of big data analytics and data-driven culture. *Journal of Environmental Planning and Management*, 1–26. https://doi.org/10.1080/09640568.2023.2189544

Kirchherr, J., Reike, D., & Hekkert, M. (2017, December). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling*, *127*, 221–232. https://doi.org/10.1016/j.resconrec.2017.09.005

Kiselev, A., Magaril, E., Panepinto, D., Rada, E. C., Ravina, M., & Zanetti, M. C. (2021, November 21). Sustainable Energy Management Benchmark at Wastewater Treatment Plant. *Sustainability*, *13*(22), 12885. https://doi.org/10.3390/su132212885

Klein, N., Ramos, T. B., & Deutz, P. (2021, October 27). Factors and strategies for circularity implementation in the public sector: An organisational change management approach for sustainability. *Corporate Social Responsibility and Environmental Management*, *29*(3), 509–523. https://doi.org/10.1002/csr.2215

Kouhizadeh, M., Sarkis, J., & Zhu, Q. (2019, April 25). At the Nexus of Blockchain Technology, the Circular Economy, and Product Deletion. *Applied Sciences*, *9*(8), 1712. https://doi.org/10.3390/app9081712

Kumar, V., Sezersan, I., Garza-Reyes, J. A., Gonzalez, E. D., & AL-Shboul, M. A. (2019, April 18). Circular economy in the manufacturing sector: benefits, opportunities and barriers. *Management Decision*, *57*(4), 1067–1086. https://doi.org/10.1108/md-09-2018-1070

Kumar, V., Verma, P., Mangla, S. K., Mishra, A., Chowdhary, D., Sung, C. H., & Lai, K. K. (2020, March 17). Barriers to Total Quality Management for sustainability in Indian organizations. *International Journal of Quality & Reliability Management*, *37*(6/7), 1007–1031. https://doi.org/10.1108/ijqrm-10-2019-0312

Kuzma, E. L., Sehnem, S., Machado, H. P. V., & Campos, L. M. D. S. (2021). The new business is circular? Analysis from the perspective of the circular economy and entrepreneurship. *Production*, *31*. https://doi.org/10.1590/0103-6513.20210008

Le, T. T., Behl, A., & Pereira, V. (2022, June 17). Establishing linkages between circular economy practices and sustainable performance: the moderating role of circular economy entrepreneurship. *Management Decision*. https://doi.org/10.1108/md-02-2022-0150

Lehmann, C., Cruz-Jesus, F., Oliveira, T., & Damásio, B. (2022, August). Leveraging the circular economy: Investment and innovation as drivers. *Journal of Cleaner Production*, *360*, 132146. https://doi.org/10.1016/j.jclepro.2022.132146

Łękawska-Andrinopoulou, L., Tsimiklis, G., Leick, S., Moreno Nicolás, M., & Amditis, A. (2021, May 18). Circular Economy Matchmaking Framework for Future Marketplace Deployment. *Sustainability*, *13*(10), 5668. https://doi.org/10.3390/su13105668

Li, Y., Hu, Y., Li, L., Zheng, J., Yin, Y., & Fu, S. (2022, September 13). Drivers and outcomes of circular economy implementation: evidence from China. *Industrial Management & Data Systems*, *123*(4), 1178–1197. https://doi.org/10.1108/imds-05-2022-0267

Mehmood, A., Ahmed, S., Viza, E., Bogush, A., & Ayyub, R. M. (2021, June). Drivers and barriers towards circular economy in agri-food supply chain: A review. *Business Strategy & Development*, *4*(4), 465–481. https://doi.org/10.1002/bsd2.171

Manea, D. I., Istudor, N., Dinu, V., & Paraschiv, D. M. (2021, October 4). CIRCULAR ECONOMY AND INNOVATIVE ENTREPRENEURSHIP, PREREQUISITES FOR SOCIAL PROGRESS. *Journal of Business Economics and Management*, *22*(5), 1342–1359. https://doi.org/10.3846/jbem.2021.15547

Maranesi, C., & De Giovanni, P. (2020, November 11). Modern Circular Economy: Corporate Strategy, Supply Chain, and Industrial Symbiosis. *Sustainability*, *12*(22), 9383. https://doi.org/10.3390/su12229383
Mishra, J. L., Chiwenga, K. D., & Ali, K. (2019, April 2). Collaboration as an enabler for circular economy: a case study of a developing country. *Management Decision*, *59*(8), 1784–1800. https://doi.org/10.1108/md-10-2018-1111
Mocanu, C., Militaru, E., Zamfir, A. M., & Maer-Matei, M. M. (2022). Circular economy and financial performances of European SMEs. *Circular Economy and Sustainability*, 71–86. https://doi.org/10.1016/b978-0-12-819817-9.00024-7
Munaro, M. R., & Tavares, S. F. (2023, March). A review on barriers, drivers, and stakeholders towards the circular economy: The construction sector perspective. *Cleaner and Responsible Consumption*, *8*, 100107. https://doi.org/10.1016/j.clrc.2023.100107
Murray, A., Skene, K., & Haynes, K. (2015, May 22). The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context. *Journal of Business Ethics*, *140*(3), 369–380. https://doi.org/10.1007/s10551-015-2693-2
Nandi, S., Sarkis, J., Hervani, A. A., & Helms, M. M. (2021, July). Redesigning Supply Chains using Blockchain-Enabled Circular Economy and COVID-19 Experiences. *Sustainable Production and Consumption*, *27*, 10–22. https://doi.org/10.1016/j.spc.2020.10.019
Neligan, A., Baumgartner, R. J., Geissdoerfer, M., & Schöggl, J. (2022, May 20). Circular disruption: Digitalisation as a driver of circular economy business models. *Business Strategy and the Environment*, *32*(3), 1175–1188. https://doi.org/10.1002/bse.3100
Olalekan, R. M., Adedoyin O, O., Williams, E. A., Christianah, M. B., & Modupe, O. (2019, May 22). The roles of all tiers of government and development partners in environmental conservation of natural resource: a case study in Nigeria. *MOJ Ecology & Environmental Sciences*, *4*(3). https://doi.org/10.15406/mojes.2019.04.00142
Ozili, P. K. (2021, April 15). Circular Economy, Banks, and Other Financial Institutions: What's in It for Them? *Circular Economy and Sustainability*, *1*(3), 787–798. https://doi.org/10.1007/s43615-021-00043-y
Palafox-Alcantar, P. G., Hunt, D. V. L., & Rogers, C. D. F. (2020, April 10). A Hybrid Methodology to Study Stakeholder Cooperation in Circular Economy Waste Management of Cities. *Energies*, *13*(7), 1845. https://doi.org/10.3390/en13071845
Pereno, A., & Eriksson, D. (2020, September). A multi-stakeholder perspective on sustainable healthcare: From 2030 onwards. *Futures*, *122*, 102605. https://doi.org/10.1016/j.futures.2020.102605
Pîrvu, R., Drăgan, C., Axinte, G., Dinulescu, S., Lupăncescu, M., & Găină, A. (2019, August 2). The Impact of the Implementation of Cohesion Policy on the Sustainable Development of EU Countries. *Sustainability*, *11*(15), 4173. https://doi.org/10.3390/su11154173
Prieto-Sandoval, V., Jaca, C., & Ormazabal, M. (2018, April). Towards a consensus on the circular economy. *Journal of Cleaner Production*, *179*, 605–615. https://doi.org/10.1016/j.jclepro.2017.12.224
Qu, D., Shevchenko, T., Xia, Y., & Yan, X. (2022, July 1). Education and Instruction for Circular Economy: A Review on Drivers and Barriers in Circular Economy Implementation in China. *International Journal of Instruction*, *15*(3), 1–22. https://doi.org/10.29333/iji.2022.1531a
Rani, R., & Lobiyal, D. K. (2020, September 19). An extractive text summarization approach using tagged-LDA based topic modeling. *Multimedia Tools and Applications*, *80*(3), 3275–3305. https://doi.org/10.1007/s11042-020-09549-3
Ranta, V., Aarikka-Stenroos, L., & Mäkinen, S. J. (2018, November). Creating value in the circular economy: A structured multiple-case analysis of business models. *Journal of Cleaner Production*, *201*, 988–1000. https://doi.org/10.1016/j.jclepro.2018.08.072
Rizos, V., Behrens, A., van der Gaast, W., Hofman, E., Ioannou, A., Kafyeke, T., Flamos, A., Rinaldi, R., Papadelis, S., Hirschnitz-Garbers, M., & Topi, C. (2016, November 23). Implementation of Circular

Economy Business Models by Small and Medium-Sized Enterprises (SMEs): Barriers and Enablers. *Sustainability*, *8*(11), 1212. https://doi.org/10.3390/su8111212
Rodríguez-Espíndola, O., Cuevas-Romo, A., Chowdhury, S., Díaz-Acevedo, N., Albores, P., Despoudi, S., Malesios, C., & Dey, P. (2022, June). The role of circular economy principles and sustainable-oriented innovation to enhance social, economic and environmental performance: Evidence from Mexican SMEs. *International Journal of Production Economics*, *248*, 108495. https://doi.org/10.1016/j.ijpe.2022.108495
Rok, B., & Kulik, M. (2020, November 11). Circular start-up development: the case of positive impact entrepreneurship in Poland. *Corporate Governance: The International Journal of Business in Society*, *21*(2), 339–358. https://doi.org/10.1108/cg-01-2020-0043
Sabharwal, R., & Miah, S. J. (2022, April 28). An intelligent literature review: adopting inductive approach to define machine learning applications in the clinical domain. *Journal of Big Data*, *9*(1). https://doi.org/10.1186/s40537-022-00605-3
Salvioni, D., & Almici, A. (2020). Circular Economy and Stakeholder Engagement Strategy. *Symphonya. Emerging Issues in Management*, *1*, 26. https://doi.org/10.4468/2020.1.03salvioni.almici
Saura, J. R., Ribeiro-Soriano, D., & Palacios-Marqués, D. (2022, June 3). Adopting digital reservation systems to enable circular economy in entrepreneurship. *Management Decision*. https://doi.org/10.1108/md-02-2022-0190
Sehnem, S., Queiroz, A. A. F. S. L., Pereira, S. C. F., Santos Correia, G., & Kuzma, E. (2021, October). Circular economy and innovation: A look from the perspective of organizational capabilities. *Business Strategy and the Environment*, *31*(1), 236–250. https://doi.org/10.1002/bse.2884
Shanker, S., & Barve, A. (2021, January 5). Analysing sustainable concerns in diamond supply chain: a fuzzy ISM-MICMAC and DEMATEL approach. *International Journal of Sustainable Engineering*, *14*(5), 1269–1285. https://doi.org/10.1080/19397038.2020.1862351
Sharma, N. (2021, April 7). Using positive deviance to enhance employee engagement: an interpretive structural modelling approach. *International Journal of Organizational Analysis*, *30*(1), 84–98. https://doi.org/10.1108/ijoa-07-2020-2341
Singh, S. K., & Gaur, S. S. (2018, January 8). Entrepreneurship and innovation management in emerging economies. *Management Decision*, *56*(1), 2–5. https://doi.org/10.1108/md-11-2017-1131
Srivastava, A., & Dashora, K. (2021, April 9). A Fuzzy ISM approach for modeling electronic traceability in agri-food supply chain in India. *Annals of Operations Research*, *315*(2), 2115–2133. https://doi.org/10.1007/s10479-021-04072-6
Suchek, N., Fernandes, C. I., Kraus, S., Filser, M., & Sjögrén, H. (2021, May 25). Innovation and the circular economy: A systematic literature review. *Business Strategy and the Environment*, *30*(8), 3686–3702. https://doi.org/10.1002/bse.2834
Sulaiman, Z., Ahmad Sugiran, H. S., Hasbullah, N. N., Mas'od, A., Hashim, S., & Bradley, D. A. (2022, February 17). Public Awareness of Consumer Products Containing Radioactive Materials: Empirical Evidence from Malaysia. *International Journal of Environmental Research and Public Health*, *19*(4), 2326. https://doi.org/10.3390/ijerph19042326
Svensson-Hoglund, S., Richter, J. L., Maitre-Ekern, E., Russell, J. D., Pihlajarinne, T., & Dalhammar, C. (2021, March). Barriers, enablers and market governance: A review of the policy landscape for repair of consumer electronics in the EU and the U.S. *Journal of Cleaner Production*, *288*, 125488. https://doi.org/10.1016/j.jclepro.2020.125488
Tan, J., Tan, F. J., & Ramakrishna, S. (2022, February 3). Transitioning to a Circular Economy: A Systematic Review of Its Drivers and Barriers. *Sustainability*, *14*(3), 1757. https://doi.org/10.3390/su14031757
Tura, N., Hanski, J., Ahola, T., Ståhle, M., Piiparinen, S., & Valkokari, P. (2019, March). Unlocking circular business: A framework of barriers and drivers. *Journal of Cleaner Production*, *212*, 90–98. https://doi.org/10.1016/j.jclepro.2018.11.202

Vafadarnikjoo, A., Ahmadi, H. B., Hazen, B. T., & Liou, J. J. H. (2020, March 3). Understanding Interdependencies among Social Sustainability Evaluation Criteria in an Emerging Economy. *Sustainability*, *12*(5), 1934. https://doi.org/10.3390/su12051934

van Boerdonk, P., Krikke, H., & Lambrechts, W. (2021, February). New business models in circular economy: A multiple case study into touch points creating customer values in health care. *Journal of Cleaner Production*, *282*, 125375. https://doi.org/10.1016/j.jclepro.2020.125375

Van Opstal, W., & Borms, L. (2023, April). Startups and circular economy strategies: Profile differences, barriers and enablers. *Journal of Cleaner Production*, *396*, 136510. https://doi.org/10.1016/j.jclepro.2023.136510

Wackernagel, M., Hanscom, L., & Lin, D. (2017, July 11). Making the Sustainable Development Goals Consistent with Sustainability. *Frontiers in Energy Research*, *5*. https://doi.org/10.3389/fenrg.2017.00018

Wang, G., Krzywda, D., Kondrashev, S., & Vorona-Slivinskaya, L. (2021, January 11). Recycling and Upcycling in the Practice of Waste Management of Construction Giants. *Sustainability*, *13*(2), 640. https://doi.org/10.3390/su13020640

Wilson, M., Paschen, J., & Pitt, L. (2021, March 2). The circular economy meets artificial intelligence (AI): understanding the opportunities of AI for reverse logistics. *Management of Environmental Quality: An International Journal*, *33*(1), 9–25. https://doi.org/10.1108/meq-10-2020-0222

Wrålsen, B., Prieto-Sandoval, V., Mejia-Villa, A., O'Born, R., Hellström, M., & Faessler, B. (2021, October). Circular business models for lithium-ion batteries - Stakeholders, barriers, and drivers. *Journal of Cleaner Production*, *317*, 128393. https://doi.org/10.1016/j.jclepro.2021.128393

Wu, C. Y., Hu, M. C., & Ni, F. C. (2021, April). Supporting a circular economy: Insights from Taiwan's plastic waste sector and lessons for developing countries. *Sustainable Production and Consumption*, *26*, 228–238. https://doi.org/10.1016/j.spc.2020.10.009

Zarbà, C., Chinnici, G., La Via, G., Bracco, S., Pecorino, B., & D'Amico, M. (2021, July 27). Regulatory Elements on the Circular Economy: Driving into the Agri-Food System. *Sustainability*, *13*(15), 8350. https://doi.org/10.3390/su13158350

Zhang, B., Comite, U., Yucel, A. G., Liu, X., Khan, M. A., Husain, S., Sial, M. S., Popp, J., & Oláh, J. (2021, October 18). Unleashing the Importance of TQM and Knowledge Management for Organizational Sustainability in the Age of Circular Economy. *Sustainability*, *13*(20), 11514. https://doi.org/10.3390/su132011514

Zhu, Q., Jia, R., & Lin, X. (2019, April 18). Building sustainable circular agriculture in China: economic viability and entrepreneurship. *Management Decision*, *57*(4), 1108–1122. https://doi.org/10.1108/md-06-2018-0639