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Learning from Failure and Success: The Challenges for Circular Economy Implementation in SMEs in an Emerging Economy

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Abstract: While there is ample research on the barriers and enablers for implementing circular economy (CE) in large companies and developed economies, scant research exists concerning the factors impacting CE implementation in small and medium enterprises (SMEs) in emerging economies. To address this gap, our research seeks to determine the internal and external barriers SMEs face when implementing CE initiatives in emerging economies and identify how they can leverage CE implementation through bottom-up approaches. We present a multiple-case study of five SMEs in Mexico. Our findings suggest that the lack of regional enabling conditions and unsuitability between the CE business strategy and the context can further exacerbate implementation barriers. In this sense, we found that in our study's unsuccessful case, the company failed to align its business to the particularities of the markets where it operated. Contrary, successful initiatives adopted strategies that incorporated contextual attributes in their business models, such as available infrastructure, current regulations, or consumer characteristics. Our results provide lessons from both failing and successful CE initiatives implemented by SMEs in an emerging economy. This work intends to help practitioners, policymakers, and researchers to create the required enabling conditions to accelerate the transition toward a CE in these regions.



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“For me, context is the key—from that comes the understanding of everything.”
—Kenneth Noland

1. Introduction

The increasing global consumption of resources, in combination with a predominantly linear carbon-based economy, is generating a debt-based unsustainable growth [1]. Likewise, the growing demand and the scarcity of natural resources are also exposing firms to supply disruption and price volatility, threatening their profitability and long-term survival. As a result, the demand for adopting sustainable strategies, such as Circular Economy (CE), has increased among firms [2]. CE has been proposed as an alternative capable of decoupling natural resource consumption from economic growth [3]. Under a CE approach, sustainable value creation is promoted through a more balanced, systemic, and holistic perspective, improving a firm's overall economic, environmental, and social performance [4]. Fonseca et al. [4] further noted, based on a survey carried out among 99 Portuguese organizations, that some firms regard CE as a relevant strategy for improving their organizational profitability and value creation, as well as their environmental performance [4]. Despite CE's benefits, its widespread implementation has been slow, specifically in emerging economies [5,6].

Broadly, discussion of CE has rarely touched the implementation level [7,8]. However, authors addressing the topic have suggested that CE's sluggish adoption can be attributed to a lack of enabling conditions and various challenges that firms face during implementation [6]. The implementation of CE principles can be introduced either top-down, where

policymakers play a significant role, or bottom-up, where firms act first via innovation [9]. Top-down approaches can also translate into poor enabling conditions, where governments are unable or unwilling to support CE initiatives, or where no infrastructure is in place, which is the case in many emerging economies [6]. In this light, it is not surprising that the enabling conditions play a major role in CE implementation at a larger scale [10]. Hence, the CE initiatives that developed economies have adopted cannot be easily taken as a role model and extended to some emerging economies because political, socio-economic, and cultural factors may differ remarkably from developed economies [10,11]. Therefore, for CE to succeed in emerging economies, firms must instead act through bottom-up approaches and adapt their CE initiatives to their surrounding context [12].

Although previous researchers have identified CE enablers and barriers that firms face during implementation (e.g., [13,14]), most empirical research has focused on large firms and developed economies rather than small and medium-sized enterprises (SMEs) and emerging economies (e.g., [15]). In this respect, several authors [12,16] have recognized that both large and SMEs face barriers to different extents. For instance, Rizos et al. [16] mention that firm size can affect technology development, technical skills, and resource access, impacting CE implementation. Despite the available knowledge, there is still a major gap concerning SMEs in emerging economies. In this regard, how are SMEs, with all their mentioned limitations, coping with CE implementation in emerging markets where conditions are often lacking and financial sources are scarce? The lack of empirical research in this matter represents a significant drawback for emerging economies, where SMEs still represent their economy's backbone and play a substantial role in job generation and economic development [16]. In Mexico alone, SMEs represent 52.2% of the national GDP [17]. In contrast, just as SMEs can contribute to economic growth, SMEs conducting business as usual can also contribute to increasing social inequality and environmental degradation [18]. It is, therefore, essential to further understand the mentioned research gap, as migrating to a CE could benefit SMEs in emerging markets—for instance, by creating a sustained competitive advantage or by decreasing their negative externalities in these regions [12].

Our research aims to accurately answer the following research questions: (a) What are the external barriers and enablers that SMEs in emerging economies face when implementing CE initiatives? (b) How can SMEs in emerging economies leverage the implementation of CE initiatives through bottom-up approaches? To answer these questions, we present a multiple-case study of five SMEs located in Mexico, an emerging economy. Specifically, we gathered data using in-depth interviews and analyzed it by using a hybrid-thematic analysis. Furthermore, we assessed the correspondence between barriers and enablers drawn from the literature with the empirically derived ones. This study's novelty is four-fold: it adds to the ongoing literature by comparing empirical- and literature-found barriers and enablers. It documents five new case studies of SMEs in emerging economies that have already implemented CE initiatives. Moreover, it incorporates a failing case, which provides a critical frame to study implementation barriers more transparently. Finally, this research also guides policymakers and companies on what enabling conditions are needed to implement CE in emerging economies successfully. Our results provide lessons learned from both failing and successful CE initiatives implemented by SMEs in an emerging economy. This work is intended to be useful to both scholars and practitioners. The insights are particularly relevant to shedding light on a previously underexplored research area that continues to affect the adoption of CE principles by SMEs in emerging economies.

The remainder of this paper is organized as follows: Section 2 presents the conceptual framework. Section 3 describes the sample used and the methodology applied in this research. The research findings from both the literature review and the analysis of case studies are summarized in Section 4. Section 5 proceeds with the discussion of our results. Finally, Section 6 provides concluding remarks and highlights the theoretical and practical implications; this section also addresses the limitations and potential future research paths.

2. Conceptual Framework

2.1. Circular Economy (CE)

CE is a rapidly growing field grounded in the study of nonlinear systems. According to the Ellen MacArthur Foundation (EMF) [19], the CE concept has its roots in several schools of thought, such as the cradle-to-cradle design [20], biomimicry [21], and industrial ecology [22]. To date, the most well-known definition of CE is the one provided by the EMF [23,24], which defines the CE as an “industrial system that is restorative or regenerative by intention and design” and that “aims for the elimination of waste through the superior design of materials, products, systems, and business models” [2] (p. 15).

Transitioning to a CE could provide potential benefits to the implementing regions, industries, or companies. Some identified potential benefits linked to CE adoption are decoupling natural resource consumption from economic growth, optimizing resource performance, and generating new jobs [3]. Additionally, by adopting superior design materials and circular business models, firms could finally reach their sustainability goals [2].

The CE operates at three levels: the microlevel (e.g., products or company), the mesolevel (industrial parks), and the macrolevel (e.g., region or nation) [24]. Although the three levels are essential for achieving CE’s widespread adoption, our research will focus on the microlevel, as the discussion about its implementation remains widely under-researched [8,10].

- CE Implementation

CE approaches can be introduced either top-down, where policymakers play a major role, or bottom-up, where individuals, firms, and organizations act first via innovation [9,10]. On the one hand, top-down implementation involves developing conditions such as supporting infrastructure, adequate legislation and policy, and social awareness, which in conjunction can aid leveraging CE implementation in a given context [10]. In these cases, CE implementing companies are supported by the host institutions, legal arrangements, or the market itself [25]. On the other hand, bottom-up implementation refers to industrial efforts aiming to reduce their environmental impact and adopt circular practices. Bottom-up approaches can be achieved through collaborative business models, circular product design, and product life cycle management, among others [10].

- From the concept to practice: The ReSOLVE framework

Several frameworks have been developed throughout the literature to support the circular transition (e.g., [26,27]). This article follows the ReSOLVE framework, which takes the core principles of circularity and transforms them into six implementation action areas: Regenerate, Share, Optimize, Loop, Virtualize, and Exchange [28]. Firms can use the framework as a guideline to facilitate their transition toward CE. The framework introduces examples in each action area to help firms identify CE implementation opportunities [26,28] (see Appendix A for further details of each action area).

- Top-down: CE implementation in emerging economies

While emerging and developed economies may share challenges concerning CE implementation, emerging economies possess specific contextual conditions that may further hinder CE implementation [6,11]. For instance, in some developed economies, specifically in Europe, CE is regulated via a top-down approach, with governments aligning or creating regional conditions that encourage the proliferation of CE initiatives across the country. In contrast, emerging economies are often characterized by corruption, the absence of strong legislation, and low monitoring and regulation compliance [11,25,29]. Additional challenges may include poor infrastructure development or its complete absence [30–32], and barriers associated with low environmental literacy, lack of social inclusion, and resource scarcity [33]. Consequently, as Patwa et al. [6] state, an initiative implemented in developed economies cannot be easily taken as a role model and extended to some emerging economies [6].

Furthermore, although there are specific challenges that firms might not have control over, firms can act and align their business models and strategies with their surrounding contexts to succeed in their circular endeavors. In this sense, implementation of CE initiatives and success in emerging economies might depend on firms aligning their business model to customers' needs and specific contextual conditions [6,33,34].

- Bottom-up: CE implementation in SMEs in emerging economies

According to the World Bank (2020), SMEs represent about 90% of existing businesses worldwide, accounting for more than 50% of employment. In emerging markets particularly, SMEs play a major role in economic development and job creation, representing approximately seven out of ten existing formal jobs [35]. In this line of thought, just as SMEs can contribute to economic development, their prevailing linear economy business models can also generate negative impacts within their operating contexts [18].

Although not directly linked to CE, SMEs have become increasingly aware of the benefits associated with resource efficiency [12]. According to the literature, the main motivations to migrate toward a CE among European SMEs include resource-saving, creating competitive advantage, and creating new markets [12]. While there are clear benefits associated with the transition, adoption of CE business models has not been straightforward. Additionally, several authors [16] showed that most SMEs have limited resources and do not see CE as a priority or perceive its benefits.

Although migrating to a CE could favor SMEs, SMEs in emerging markets face a double pressure. The lack of enabling conditions is inherent to the emerging markets and the challenges associated with their smaller size and resource scarcity, which may limit their bottom-up approaches. On the one hand, context and enabling conditions can determine factors such as the "rules of the game", the customers' culture and prominent behaviors, and the financial or technological support [6]. On the other hand, firm size can affect technology development, capabilities, skills, know-how, and resource access [12,16]. In short, SMEs in emerging markets need to be further studied to understand the main barriers and enablers to help leverage CE initiatives in these regions and to accelerate the global transition to a CE.

2.2. The Role of SMEs in the Mexican Economy

SMEs are globally regarded as pioneers of new ideas, processes, products, and business models. Their flexibility allows them to accelerate their effective use of resources and to promote innovative ideas. Mexican SMEs have not been the exception, and as the present study suggests, there has been a nascent interest in new business models and a business philosophy based on a CE.

Employing over 26 million people, SMEs in Mexico represent 52.2% of the country's GDP [17]. With over 4.1 million SMEs operating in the manufacturing, service, and commercial sectors [36], SMEs in Mexico represent the backbone of the economy, partly because of their high impact on employment generation representing 68.4% of the total economically active population and partly because they encompass 99.8% of the total number of companies in the country [17].

According to Méndez [37], in Mexico, SMEs are characterized as being family-owned, founded by their own money, and operating a low scale production, with the owners leading the company's transformation and evolution. Furthermore, SMEs usually produce for domestic markets, although international markets are also a possibility, and usually receive some tax benefits from the federal government [37]. In countries such as Mexico, SMEs are considered complex, competitive, and sometimes chaotic, and are often characterized by an intense pressure to be competitive, efficient, and innovative.

3. Methodology

We divided the research design into two phases: the first phase is the theoretical phase, intended to address our first research question. For this phase, a systematic literature review was carried out to identify barriers and enablers that firms face when implementing

CE initiatives. In this phase, theoretical barriers and enablers were codified into major themes and subthemes, creating a codebook that we later used to compare our empirically derived barriers and enablers.

The second phase complemented both the first research question and addressed our second research question. This phase aimed to identify how SMEs in emerging economies can leverage CE implementation through bottom-up approaches. The theoretical challenges and enablers were empirically corroborated in this phase, employing a multiple-case study methodology.

3.1. Phase 1: A Literature Review of CE Barriers and Enablers (The Codebook)

We performed a systematic literature review to identify barriers and enablers related to CE implementation at the firm level [38]. Figure 1 depicts the research design and the criteria used in the search. The study began by executing a Boolean search of articles published between 2010–2020 in EBSCO and Scopus databases. After filtering results, we performed an abstract screening where articles were removed if they did not comply with our set criteria. Finally, a snowball procedure was carried out, in which additional papers were identified using the reference lists [39].

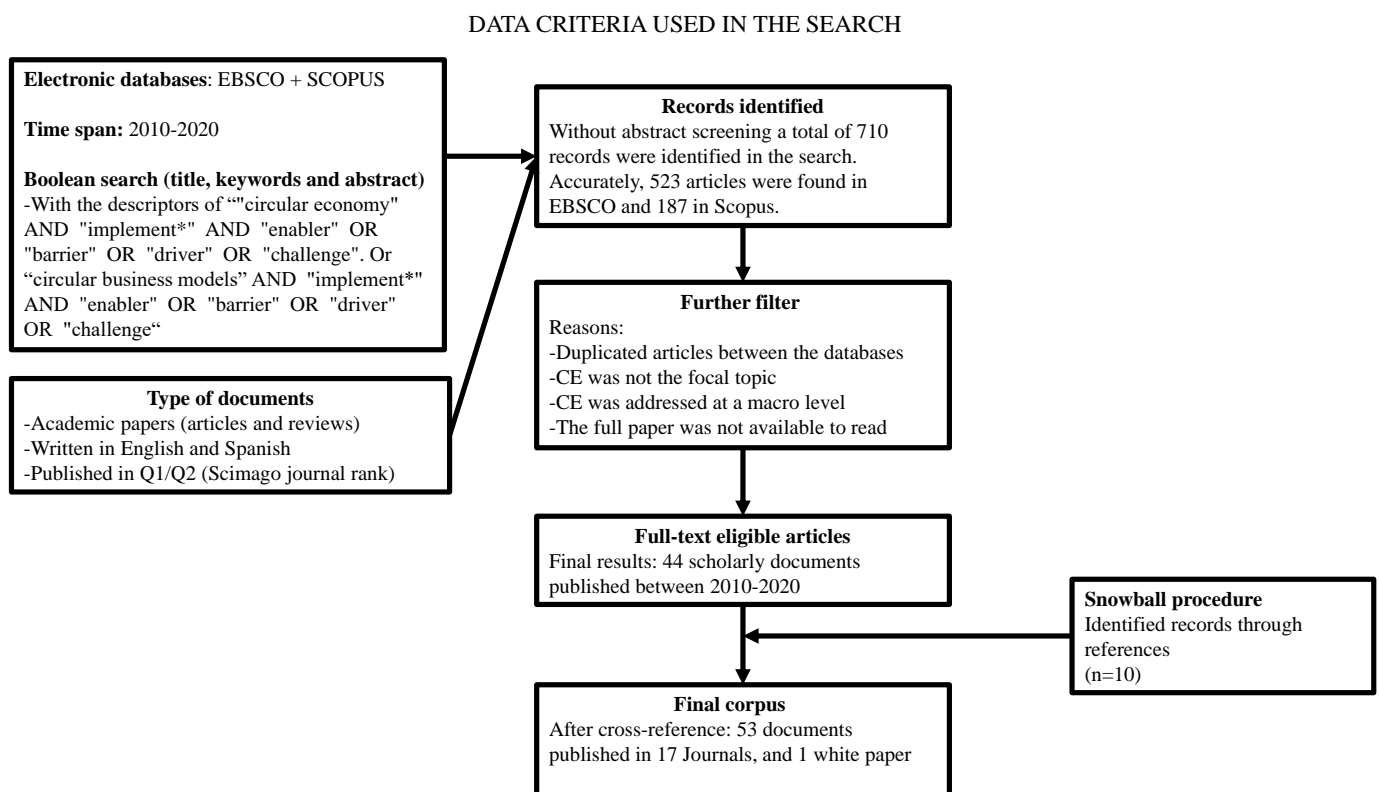


Figure 1. Research design: data criteria used in the systematic literature review search.

3.2. Phase 2: Empirical Stage

For the second phase, the study followed a qualitative approach, as we were concerned with emerging explanations of the social phenomena [40,41]. Specifically, we decided to use case studies to highlight the relevant contextual conditions [42]. For this, we performed a multiple-case study to understand and explore similarities or differences between and within cases [40,43].

3.2.1. Sample Selection

We opted for a purposeful sample as this technique can identify and select information-rich cases while facilitating an in-depth understanding of the rare or novel phenom-

ena [44,45]. We applied the following selection criteria for this study: (1) the firm had operations in Mexico; (2) the firm had a staff number lower than 250 employees—this classification was based on the OECD criteria [46]; (3) the firm was undergoing a CE initiative. To determine the latter criterion, we considered several points. The first point is that the initiative was mapped during The CE Mapping Week (CEMP)—an event carried out by the CE Club (CEC) in Mexico City in March 2018. The CEMP is a collaborative session held across different cities; its objective is to gather as many circular initiatives as possible in an open online directory. Thirty companies, both large and small, were identified in the directory, in which 13 were identified as SMEs. From those results, the authors did the first screening to identify the main activities carried out in each firm; the activities were matched against the ReSOLVE framework, and firms were filtered out if they did not meet any of its six action areas. Other firms were added to the list if the authors worked previously with the company—such was the case of Company E. A total of 12 firms were contacted. From those, only five agreed to be interviewed. Notably, one of the cases represents a failed CE case. We used this case as an extreme or polar case due to its unique features [47]; the case provided us with a critical frame to study implementation barriers more transparently [47]. We complemented our results with an additional interview with a CE expert that helped validate our findings.

3.2.2. Data Collection

Qualitative data were collected using semistructured interviews based on Qu and Dumay [48] and Hancock [41]. Afterward, we carried out a pilot test to validate and measure the interview's length and logic. The final interview comprised 62 questions divided into three sections: warm-up questions, CE strategy, and final questions. As a highlight, the CE strategy section was based on the ReSOLVE framework. In this section, interviewees were asked to identify successful and failed initiatives based on each ReSOLVE action area [28]. The full questionnaire containing the background information is provided in Appendix A.

Given the size of these firms and the number of employees (2–10), it was not easy to perform more than one interview per company, and therefore we opted to interview the firm's founder for all cases. Moreover, to ensure data reliability, triangulation of data was performed; we used multiple sources when available such as e-mails, web pages, and media reports for building the case studies [49]. Table 1 depicts the resulting list, which consists of five case studies comprising different industries' circular initiatives. A more extensive summary for each firm is provided in Appendix B.

Table 1. Firm characteristics.

| Case ID | Sector | Number of Employees | Founding Year | ReSOLVE Initiative | Interviewee's Position in the Firm |
|---------|---------------|---------------------|--|--|------------------------------------|
| A | Manufacturing | 8–10 | 2014 | Optimize, Virtualize, Exchange. | Founder |
| B | Manufacturing | 5 | 2010 | Optimize, Virtualize, Exchange. | Founder |
| C | Manufacturing | 7 | 2013 | Regenerate, Optimize, Virtualize, Exchange | Founder |
| D | Services | 6 | 1.5 years before going out of business | Sharing and Virtualize | Founder |
| E | Services | 2 | 2014 | Exchange | Founder |

In total, we conducted six interviews between December 2018 and January 2020 with the firm representatives and the CE expert. Each interview was carried out face to face or through a video call platform. On average, each interview lasted about 90 min. All interviews were digitally recorded and transcribed verbatim as word documents. We later coded all documents using the qualitative data analysis software Atlas.ti (version 9).

3.2.3. Data Analysis

The qualitative analysis took place in two rounds. In the first round, we codified the text using a hybrid-thematic analysis. The hybrid modality is preferred when there is scarce research on a subject, as in our case [50,51]. Moreover, researchers advocate for mixed-method approaches in social sciences to have a benchmark to compare results [50]. In this sense, instead of relying exclusively on inductive coding (i.e., open coding or emerging coding), we used an a priori code distilled from the categories identified during the literature review. The literature review factors, which can be observed in Tables 2 and 3, were later used to compare our empirically derived factors; this allowed us to discuss the main highlights in the context of emerging economies.

The coding was performed independently by two of the authors. In the first round, the authors grouped sentences or paragraphs into codes and categories, using both inductive and deductive coding. After the first round, both researchers sought similarities and differences among the codes and categories, deleting and merging them for more clarity [51,52]. After the first stage and knowing that authors are subject to interpreting terms and passages differently, the authors discussed the results of both emergent and deductive codes to reach a final consensus. After this step, we calculated an intercoding agreement of 80% (Krippendorff's α_c and $\alpha_{cu} \geq 0.80$), which is considered highly satisfactory [53]. After reaching a satisfactory agreement, we proceeded to the second round of coding.

In the second round, we grounded our results in the theoretical realm, where themes emerged through axial coding [54]. More abstract codes emerged during this phase, grounded in describing and explaining our main research questions [8,55]. In other words, we searched the literature to explain our inductive findings. Second-order codes are one of the main discussions in this paper. The results of these themes are presented in Phase 2 of Section 4.

4. Results

4.1. Phase 1: Theoretical Barriers and Enablers

This section presents our systematic literature review. Due to the small number of studies linked to CE implementation in SMEs or emerging economies at the time of our search [15], our review was extended to include worldwide studies implementing CE at the microlevel. The results helped us create a codebook comprised of theoretical barriers and enablers, which was later used to compare our Phase 2's empirically derived factors.

Identified barriers and enablers were classified into nine major groups and nested as either external or internal to the focal firm. External factors refer to factors outside of the firm conditions that might enable or hinder CE implementation, whereas internal factors refer to pressures emerging from within a company [14].

Based on the literature review, we identified five external categories for both barriers and enablers; these were: (1) *user's behavior*, (2) *regulatory*, (3) *infrastructure*, (4) *economy and competitive markets*, and (5) *supply chain*. As a general specification, we need to emphasize that these classifications are not new and have been identified partially by different authors (e.g., [6,14,56]). For instance, some authors identified economic barriers and organizational barriers [56]. Furthermore, we identified four major internal categories for both barriers and enablers. These were: (6) *knowledge*, (7) *financial*, (8) *organizational*, and (9) *product and material characteristics*—the latter category was based on Bressanelli et al. [23].

In the next subsection, we describe the nine categories. Their description is supported by Tables 2 and 3, which provide further subcategories and also depict their literature references. Moreover, to economize space, the empirical evidence—resulting from Phase 2 case studies—is also presented in both tables.

Table 2. Theoretical barriers for circular economy (CE) implementation and empirical evidence from case studies. Corroborated empirical evidence is marked with an “X” and uncorroborated with a “-”.

| Type of Barrier | Associated Issues | Empirical Evidence | Ref. | |
|-------------------------------|--|--------------------|-----------------------------|--|
| External | | | | |
| User's Behavior | | | | |
| Budget | - Low willingness to pay. | X | [8,12–15,23,34,42,52,56–68] | |
| | - Preference to buy disposable products. | X | | |
| Preference and Demand | - Attitudes and conduct (e.g., the prevalence of a throw-away society). | X | | |
| | - Costumers rigidity, inertia, and reluctance to change. | X | | |
| | - Ownership value (e.g., the prevalence of buy and own society). | X | | |
| Understanding and Perception | - Bad perception of recycled or reused products (e.g., unclean). | X | | |
| | - Lack of awareness in the environment or material recyclability. | X | | |
| Regulatory | | | | |
| Implementation | - Lack of law enforcement and poor accountability of governments. | - | | |
| | - Infrastructure does not support functioning CE. | X | | |
| | - Government prioritizes short-term actions. | - | | |
| Incentives | - Lack of effective collaboration mechanism. | X | | |
| | - Limited funding for CE. | - | | |
| Political Landscape | - Misaligned or no incentives to support CE (e.g., no incentive for using secondary material). | X | | |
| | - Unstable political condition or corruption. | X | | |
| Promotion and Awareness | - Lack of education campaigns toward CE. | X | | |
| Regulation | - Lack of regulations, standards, and laws, or mismatch between current legislation and legislation aimed at achieving a CE. | X | | |
| | - Lack of defined national goals to move toward CE. | - | | |
| Infrastructure | | | | |
| Infrastructure irregularities | - High costs linked to the recovery, transportation, and sorting of waste. | - | | |
| | - Lack of effective collection, separation, and recovery infrastructure. | X | | |
| | - Dispersion of post-consumer waste. | X | | |
| | - Limited availability on quantity and quality of recycled material. | X | | |
| | - The informal sector is not integrated into the waste management system. | - | | |
| Technology | - The lack and existence of appropriate technology to support CE. | X | | |
| | - Technology access (e.g., to separate the biological or technical mixes). | - | | |

Table 2. Cont.

| Type of Barrier | Associated Issues | Empirical Evidence | Ref. |
|--|---|--------------------|---|
| Economy and Competitive Markets | | | |
| Capital and Funding | - Lack of access to capital and financing tools. | X | |
| Market Competition | - Uneven playing field. Linear-based companies have more advantages over circular ones. | X | |
| | - Competition from unregulated recovery sector. - Arrangements in the waste and resource management market. | - X | [10,12–15,23,32,42,57–59,61–63,66–68,71,75,80–83] |
| Market Trends | - Uncertainty about the marketplace (e.g., economic downturn). | X | |
| | - Poor or little market demand for circular products. | X | |
| | - Low prices of recycled materials inhibit their collection and availability. | X | |
| Supply Chain | | | |
| Availability | - Existence of a “green” suitable supply chain. | X | |
| Cooperation | - Lack of information sharing or data transparency. | - | |
| | - Lack of supply chain integration, collaboration, and effects of supply chain complexity. | X | |
| | - Lack of trust and compatibility between partners. | X | [8,12–14,23,26,32,56–58,63–66,71,75,76,79,80,84,85] |
| | - Current suppliers resist change. - Power balance in buyer–supplier relationship and supply chain position. | - - | |
| Logistics | - Geographic dispersion and scope of global supply chains. | X | |
| | - Difficulties associated with product traceability, collection, and storage. | X | |
| | - No reverse logistics in place. | X | |
| Type of barrier | Associated Issues | | Ref. |
| Internal | | | |
| Knowledge | | | |
| Communication | - Asymmetric information and no communication among the employees or within the company’s departments. | X | |
| Information access and awareness | - There is no awareness of CE or the environment. | X | |
| | - Insufficient information management systems (e.g., lack of access to real data). | X | [12,15,16,23,32,42,56,57,64,65,67,69–73,75,78,81,86,87] |
| Information on CE | - No clear information on CE guidelines, performance indicators, and reference points. | X | |
| | - Limited application of current sustainable business models and frameworks (e.g., CE frameworks might not be replicable in another context). | X | |

Table 2. Cont.

| Type of Barrier | Associated Issues | Empirical Evidence | Ref. |
|----------------------------------|---|--------------------|--|
| Financial | | | |
| Investment Cost | - Large costs of investments associated with monitoring, machinery, transaction costs, investments, among others. | X | [6,12–15,23,26,42,52,68,71,76,82] |
| Revenue Model and Cost Structure | - Business model viability and profitability. | X | |
| Risk | - Risk associated with implementation, such as financial risks. - Cannibalization of own market share. | X - | |
| Organizational | | | |
| Corporate Governance | - Administrative barriers (e.g., generating lease contracts). | X | [12–16,23,29,32,42,52,56–58,61–63,65–67,69–71,73,75,76,78,81–88] |
| | - Resistance of powerful stakeholders. | X | |
| | - Hierarchical system inhibits flexibility and innovation. | - | |
| Culture | - Perception of sustainability as a cost and not as an investment. | - | |
| | - Industry focus on end-of-pipe solutions. | - | |
| | - Silo mentality. | - | |
| | - Resistance to change. | X | |
| Management | - Risk aversion of managers. | X | |
| | - A linear mindset for top managers and lack of system thinking. | X | |
| | - Managers have limited knowledge of the CE concept. | X | |
| | - Limited environmental awareness of the directors and decisionmakers. | - | |
| Organizational Capabilities | - Lack of expertise or skills. | X | |
| | - Lack of training and education. | - | |
| | - Lack of organizational capabilities necessary for implementing circular business across different organizational functions. | X | |
| Organizational Resources | - Lack of organizational resources (e.g., time and human). | X | |
| | - Oversight and reluctance of operators' employees. | X | |
| | - Employees have no support and guidance. | - | |
| | - Employment term limits imposed on managers affect long-term CE strategies | - | |
| Strategies | - Lack of adaptation to local context or conditions. | X | |
| | - Key performance indicators and accounting rules (e.g., the sales volume) focus on a linear economy. | X | |
| | - CE is not integrated into the strategy, mission, vision, or goals. | X | |
| | - Unclear or weak CE business model. | X | |

Table 2. Cont.

| Type of Barrier | Associated Issues | Empirical Evidence | Ref. |
|---|---|--------------------|---|
| Product and Material Characteristics | | | |
| Design | - Material and product complexity (e.g., too many types of plastic). | - | [8,13,23,32,56,57,59,63,67,68,71,75,76,79,81,85,87] |
| | - Incorrect design of products (e.g., not designed for longevity, disassembly, or reuse). | - | |
| | - Design constraints or aesthetic issues (e.g., material substitution constrains). | X | |

Table 3. Theoretical enablers for circular economy (CE) implementation and empirical evidence from case studies. Corroborated empirical evidence is marked with an “X” and uncorroborated with a “-”.

| Type of Enabler | Associated Issues | Empirical Evidence | Ref. |
|------------------------------|---|--------------------|--|
| External | | | |
| User's Behavior | | | |
| Budget | - Consumers are willing to pay a surplus for CE products. | X | |
| | - Consumers are likely to switch to circular products if linear products have higher prices than circular products. | X | |
| Preference and Demand | - Enhance collaboration with customers (e.g., personalized incentives and promotions to encourage customers to return packaging). | X | [14,15,23,32,64,66–69,72,76,85,87,89] |
| | - Increased public opinion and pressure. | - | |
| | - Cultural acceptance of circular business models, such as Product as Service. | X | |
| Understanding and Perception | - Consumers are likely to support circular business models (e.g., remanufacturing) if the linear product is of low utilization. | X | |
| | - High environmental literacy and awareness. | X | |
| Regulatory | | | |
| Implementation | - Government incentivizes and develops the needed infrastructure (e.g., waste management). | X | |
| | - Governmental long-term planning. | - | |
| | - Law enforcement. | - | |
| Incentive | - Government funding for CE initiatives. | X | |
| | - Tax benefits or tax breaks toward CE (e.g., the incentive for secondary resource markets). | - | |
| Promotion and Awareness | - Certification, awards, and standards established to showcase sustainable material usage. | X | [10,12,15,26,29,32,34,57,59–62,66,67,69,72,80,81,84,85,87,90,91] |
| | - Promote the use of sustainable and circular strategies | X | |
| | - Inform citizens about the concept of the CE | - | |

Table 3. Cont.

| Type of Enabler | Associated Issues | Empirical Evidence | Ref. |
|--|---|--------------------|---|
| Regulation | - Establish laws and policies toward sustainability and CE. | X | |
| | - Create policy and legislation to integrate ecological and societal costs into the final price. | - | |
| | - Development of labeling standards that reflect the values of circularity. | - | |
| Infrastructure | | | |
| Available Infrastructure | - Effective collection and treatment of waste (e.g., recovery, transportation, storage, sorting waste). | X | [6,10,15,32,59,61] |
| | - Guaranteed quantity and quality of the recycled materials. | X | |
| Technology | - Geographical proximity | X | |
| | - Availability of technologies that facilitate recycling, optimization, or remanufacturing (e.g., more effective techniques to collect, separate, and recycle discarded materials). | X | |
| Economy and Competitive Markets | | X | |
| Capital and Funding | - Access to financial tools (e.g., private investors or international prize challenges). | X | [12,15,32,52,66,72,76,78,87,91] |
| Market Competition | - Respond to the emerging market (e.g., sustainable business growth to position themselves). - Support from demand network | X | |
| Supply Chain | | | |
| Leadership | - Change agents. Mobilizing actors in the material chain to set up circular initiatives. | X | |
| Cooperation | - Collaboration along the supply chain. | X | [6,8,10,14,23,26,57,59,61,67,68,72,84,87,90,92] |
| | - Developing trust among the supply chain. | X | |
| | - Developing a business case that is acceptable for all the actors. | X | |
| | - Information exchange among different stakeholders (e.g., the industry). | - | |
| Incentive to Suppliers | - Provide training and knowledge in regard to CE. | - | |
| | - Create a reward program and exclusive partnerships with suppliers that are aligned with the company's requirements. | - | |
| Logistics | - Use of tools to facilitate product traceability in the supply chain. | - | |
| | - Set up a reverse supply chain for the return of resources. | - | |
| Type of Enabler | Associated Issues | | Ref. |
| Internal Knowledge | | | |

Table 3. Cont.

| Type of Enabler | Associated Issues | Empirical Evidence | Ref. |
|-----------------------------|---|--------------------|--|
| Communication | - Availability of communications technologies (e.g., communication platforms). | X | |
| Information and Awareness | - Developing knowledge (e.g., identification of suppliers with low environmental impact). | X | [10,14,15,23,52,57,59,63,68,69,72,83,84,87,89] |
| | - Digital intelligence (e.g., using IoT, Big Data, and have insight into all available data and use advanced data analytics). | X | |
| | - Clear communication on CE and its concept. - Effective communication of CE success stories. | - - | |
| Information on CE | - Availability of information on CE (e.g., business model visualization tool). | - | |
| Financial | | | |
| Financial Support | - Contractual agreements and/or alternative financing solutions such as crowdfunding. | - | [6,23,83,87] |
| | - Access to finance. | X | |
| Risk | - Conduct pilot programs to minimize risk. | X | |
| Organizational | | | |
| Corporate Governance | - Creation of a new and independent business unit for cultural adaptation and sustainability principles. | - | |
| | - Support from the parent company. | - | |
| Culture | - Internal collaboration. | X | |
| | - Company culture (e.g., oriented toward environmental awareness). | X | |
| Management | - Support and commitment from the top manager. | X | [6,10,12,14,15,23,32,52,57,59,60,62,64,67–69,72,78,83,85,87] |
| | - Strategic leadership for CE. | X | |
| | - System's thinking approach for CE implementation. - Acknowledgement of the problems of scarce resources and pollution. | - X | |
| Organizational Capabilities | - Specific training to develop new CE associated capabilities and skills. | - | |
| | - Technical capacities and technical know-how (e.g., the use of by-products as inputs for other processes). | X | |
| | - Development of cross-functional capabilities through full integration of all functions and employees. | - | |
| Organizational Resources | - Organizational resources (HR) (e.g., time and human). | X | |

Table 3. Cont.

| Type of Enabler | Associated Issues | Empirical Evidence | Ref. |
|---|--|--------------------|---------------------------|
| Strategies | - Outsourcing technical activities. | X | |
| | - CE/Sustainability integrated into strategy, mission, vision, goals & KPI. | X | |
| | - Incentivize broad participation of employees. | - | |
| | - Create circular propositions based on the full lifecycle of the product. | X | |
| | - Lobbying (firms have a voice in helping to shape government policy). | X | |
| | - Demonstration of product reliability (e.g., offering innovative warranty options or offering 'behind the curtain' view of the firm's processes). | X | |
| Product and Material Characteristics | | | |
| Design | - Redesign material for recycling, reuse, upgradability (e.g., use modular design). | X | [10,23,60,61,67,68,76,80] |
| | - Reducing the impact of product obsolescence. | X | |

4.1.1. External Barriers and Enablers

- User's behavior

The review identified three subcategories linked to the user: (1) *Budget* refers to the user's preference or willingness to pay a surplus for a "green" or circular product [23]. In this sense, Vermunt et al. [14] identified that consumers prefer to buy disposable products as they are usually cheaper or more convenient. In contrast, consumers are likely to switch to circular products if linear products have higher prices [85]. (2) *Consumers' preferences and demands* refer to the user's attitudes and behaviors that might be an enabler or barrier for the CE. For instance, users' disinterest in separating their waste or the prevalence of a thrown away society that describes a view of overconsumption, treating the existence of short-lived items as the status quo, and the discarding of materials with potential for reuse [59]. Additional barriers in this subcategory include the cultural idea that social status is often linked to property ownership and consumers' reluctance to accept circular business models [23]. The literature indicated that, at least for the last barrier, firms could nudge consumers into collaborating with them (e.g., to return a package) through the use of incentives [89]. (3) *Consumer's understanding and perception* involves several aspects. For instance, some authors identified that consumers have low or null awareness regarding the environment or CE [15]. The literature also shows that there is often a wrong perception toward reused, recycled, and refurbished products, as some consumers perceived them as unclean or unreliable [60]. Finally, governments and companies can tackle these barriers by increasing environmental literacy and awareness or through regulations [76].

- Regulatory

Five subcategories were nested in this category: (1) *Implementation* refers to government obligations, such as their obligation for infrastructure development, law enforcement, and monitoring. The review shows that barriers such as lack of law enforcement and poor accountability, low monitoring capacity, and politicians' prioritization of short-term actions due to their short time in office can hinder CE implementation [29,32]. The literature mentions that governments need to develop both the infrastructure and the incentives to support industrial development to deal with these issues [15,29]. The government also needs long-term planning and higher levels of monitoring and law enforcement [29,32]. (2) *Incentives*—this subcategory includes fiscal and financial incentives. In this sense, the literature shows that limited funding and an unaligned taxation system can hinder CE—for instance, the inexistence of incentives toward using secondary material over virgin mate-

rial [57]. In contrast, governmental financial support or financial incentives, such as tax breaks and subsidies, can stimulate the development of circular business models [57,67]. (3) The *political landscape* refers to barriers or enablers linked to the contextual political conditions, such as political instability and corruption, which may inhibit law enforcement [29]. Some authors have also linked acts of corruption to a decrease in the trust among actors in a network; in the case investigated by Casiano-Flores et al. [29], the Mexican industrial sector had little trust toward the political sphere [29]. The latter impacted the potential synergies among stakeholders, inhibiting initiatives oriented toward a CE [29]. (4) *Promotion, divulgation, and awareness* refer to barriers and enablers linked to governmental education, such as organizing education campaigns and informing citizens about CE or sustainability [90]. (5) *Regulation*—the literature has identified that inefficient standards, regulations, and policies are obstructing CE implementation [67]. On the contrary, the literature identifies regulations that include CE characteristics as enablers, such as circular procurement policies, labeling standards, or the implementation of extended producer responsibility [57,59,66].

- Infrastructure

In this category, we nested two subcategories: (1) *Infrastructure irregularities* refer to barriers linked to faulty infrastructure or its complete unavailability within a region; this can include but is not limited to the waste management or water network infrastructure [6,29]. Associated barriers can include the lack of effective recovery, transportation, and sorting of waste and the high costs of these activities [6,29,61]. In this section, we also consider barriers associated with the dispersion of postconsumer waste and the lack of formalization and inclusion of the informal sector (i.e., waste pickers), which can play an essential role in recycling activities in many emerging economies [6,33,61]. The literature identifies several enablers, such as geographic proximity to recycling locations, that could facilitate waste collection and treatment [6,80]. Additionally, it was identified that if municipalities or companies could guarantee both waste material in both volume and quality to investors, this might encourage them to invest in waste treatment plants [59]. (2) *Technology* refers to technological thresholds (e.g., separating mixed materials) and the inexistence of appropriate technologies to facilitate CE business models [15].

- Economy and Competitive Markets

We identified a total of three subcategories: (1) *Capital and funding* refer to access to capital, financial tools as well as long-term investments. Companies need greater access to new financial tools, such as private investors or international or national prize challenges to overcome funding barriers [15]. (2) *Market competition* refers to barriers associated with the unevenness of the competition playing field. For instance, linear-based companies have more advantages than circular companies due to pervasive fiscal policies or framework (e.g., subsidies for large oil companies) [57,75]. The literature also identified arrangements in the waste and resource management market as a barrier [80]. For instance, lobbying or illegal waste buying arrangements create entry barriers and a waste market dominated by a few actors, preventing access to waste in quality and quantity [80]. (3) *Market trends* refer to market forces, such as supply and demand. The review found that uncertainty about the market place, such as economic downturns, might hamper CE initiatives [12]. Moreover, little market demand for secondary material and low prices of recycled material inhibit their collection and availability, which inhibit CE initiatives [42].

- Supply chain

This category presented five subcategories: (1) *Availability* refers to the difficulty of finding appropriate supply chain partners with the required skill or oriented toward sustainability or CE; this barrier was identified by the literature review performed by Bressanelli et al. [93]. (2) *Cooperation* refers to collaboration along the supply chain or beyond the supply chain (e.g., government), including barriers such as lack of transparency and information sharing among partners [93]. Other found barriers include misaligned

and shifted profits along the supply chain, lack of trust, and partner incompatibility [84]. To tackle these challenges, firms need to support and strengthen partnerships by enhancing collaboration, and this might include developing a business case that is acceptable for all actors in the chain [8,33,59,84]. (3) *Logistics* refers to barriers or enablers linked to the product or material return flow, reverse logistics, and product traceability. In this sense, some of the barriers found were return flow uncertainty, high cost associated with returning products (e.g., storage), and geographic dispersion related to the supply chains' scope [52,93]. Several enablers were found to leverage reverse logistics—for instance, the use of tools that facilitate traceability, such as universal product codes (UPCs) or radiofrequency identifiers (RFIDs) [8]. (4) *Leadership* refers to the mobilizing power of change agents; these agents achieve a change agenda by setting up circular initiatives along the material chain [57,59]. In this sense, Cramer [59] mentioned that without these actors taking the lead, initiatives and change processes are hard to get off the ground [59]. (5) *Incentive to suppliers* refers to aligning suppliers to the company's requirement through training, reward programs, or exclusive partnerships [6].

4.1.2. Internal to the Firm

- Knowledge

This category presented a total of three subcategories. (1) *Communication*, refers to the information exchange or the lack of communication among employees or within the company's departments [57,75]. According to several authors, these could be tackled by enhancing internal collaboration and information exchange through clear, open, and transparent platforms [15,57,63]. (2) *Information access and awareness* refer to not knowing the necessary information to make informed decisions. For instance, not having access to real data or not knowing which suppliers have low environmental impacts [70]. These barriers could be decreased by developing knowledge or data, for example, by using technologies such as IoT and Big Data that could provide data insights and support advanced data analytics [63,70]. Another barrier within this subcategory includes the lack of awareness toward CE or the environment. To tackle this, the literature presents enablers, such as clear communication on the CE concepts and its success stories within the company [69]. For instance, Mura et al. [69] mention that the communication of success stories and virtuous examples of CE initiatives might demonstrate the advantages and the feasibility of the new model and enable its adoption and implementation [7,15,69]. (3) *Information on CE* refers to the lack of clear information on CE, its guidelines, and current frameworks [69]. Moreover, to the limited replicability of current business models and frameworks to different contexts [75].

- Financial

This category presented a total of three subcategories. (1) *Investment costs* refer to capital investments associated with initial costs, large investments, machinery acquisition, monitoring, or transaction costs [15,63]. The literature review points out that financial support, such as access to public and private funds and alternative financing solutions such as crowdfunding, could ease these barriers [23] (2) *Revenue model and cost structure* refers to circular business model viability. The review found that business cases with long-term turnover and low profitability are challenges to CE [14]. (3) *Risk* refers to the risk associated with implementation, such as operational and financial risks and those associated with radical innovation [26]. In this sense, the review found that conducting pilot programs could reduce some of the mentioned risk management challenges [83].

- Organizational

This category presented a total of six subcategories. (1) *Corporate governance* refers to the firm's structure and hierarchical systems. According to Liu and Bai [42], a firm's structure influences its behavior in developing CE [42]. In this sense, barriers associated with this category include inefficient bureaucracies and procedures that hamper innovation and inhibit flexibility [42]. Other barriers include resistance or conflict among influential

stakeholders [57]. (2) *Culture* refers to the shared values, goals, and predominant attitudes within a company (manager and employees) [12,57]. In this sense, perceiving sustainability as a cost instead of investment and overemphasizing recycling or “end of pipe” solutions were identified barriers [12,57,61]. (3) *Management*. Some barriers associated with this subcategory were managers with limited knowledge of the CE concept, characterized by a linear mindset and a lack of system thinking [57]. On the contrary, managers characterized by a system’s thinking approach, with the ability to acknowledge complex problems or strategic leadership skills, acted as enablers to promote CE initiatives [83]. (4) *Organizational capabilities* refer to a company’s ability to manage resources. Some barriers associated with capabilities are lack of skills or expertise and lack of technological capacity necessary for implementing CE across different organizational functions; these challenges can be tackled through employee training and education programs [63]. (5) *Organizational resources*—some barriers related to this subcategory are lack of organizational resources (i.e., time or human) and employee oversight of CE initiatives due to weariness [56]. (6) *Strategies*—the literature review identified barriers associated with the firm’s lack of adaptation to the local context, customer’s needs or regional conditions, the lack of long-term strategic goals and the lack of CE integration within the firm’s strategy [6,57]. Some identified enablers involve integrating CE within the firm’s KPI, goals, and strategy, and lobbying practices to promote legislation more aligned toward CE [57,93].

- Product and material characteristics

We identified one subcategory: (1) *Design*. The review found barriers such as material and product complexity and design constraints linked to material substitution. In this sense, the review points out that some materials become constrained by their inherent characteristics, making them hard to substitute without compromising product quality or aesthetics [8]. An additional barrier is not designing products following CE principles (e.g., easy maintenance or disassembly) [23,93].

4.2. Phase 2: Empirical Barriers and Enablers

Phase 2 focuses on answering the first research question, “What are the external barriers and enablers that SMEs in emerging economies face when implementing CE initiatives?” This section compares the theoretical findings obtained from the literature review against empirically derived barriers and enablers. As previously stated, the empirical evidence from the multiple case studies is presented in Tables 2 and 3, due to space limitations.

4.2.1. Empirical Barriers

Although we could discuss each barrier category in detail, given the space limitations, we decided to describe some of the most highlighted themes that were considered important to our context—mainly due to their novelty and relevance. Additionally, we provide evidence for the new empirical barriers in Table 4.

i. User’s Behavior

- Budget: users’ low ability to pay

Despite the availability of circular or sustainable products and services in the market, users cannot afford them, forcing them to purchase cheaper nonsustainable products. For instance, Company C fabricates reusable diapers; their package containing 12 costs USD 295.10—USD 24.59 per diaper. The average traditional diaper price is USD 0.20. In the context of emerging economies, a large segment of low-middle income consumers may be unable to afford these products [94]. To further put this in perspective, about 60.7% of Mexico’s employed population receive less than USD 363.80 per month [95]. Although Company C’s reusable diapers can last up to four years and can provide significant long-term savings, their high upfront costs exclude a large population segment who are unable to afford the products. To complement this barrier, Company B expressed that some consumers find their hand-made bamboo bikes costly. The company owner noted that

although their bikes were not the most expensive option, they were also not designed to be the cheapest in the market.

Table 4. Empirical barriers absent from the literature review.

| External Theoretical Categories | Empirical Barriers | Evidence |
|---|---|--|
| User's Behavior | | |
| Budget | - Users' low ability to pay. Consumers are not able to afford sustainable goods. | "[T]here are people who tell us: 'Hey, we like the bike, but it is costly do you sell other more affordable bamboo-items?' Company B |
| Preference and Demand | - Consumers' skepticism. (e.g., Uncertainty about the product and little or no trust). | "[O]ur rental business model needed people who owned things, who buy them and do not use them (people would upload their things and provide the inventory for the platform). However, people were very skeptical... they did not see the advantage of renting their things. There was insecurity and fear among the people. Even though our repair-replace guarantees covered their products, they did not believe much in guarantees." Company D |
| | - People's lack of familiarity with technologies. | "[T]here are people that fear online shopping . . . They rather go and buy the product at a physical store." Company C |
| Infrastructure | | |
| Infrastructure irregularities | - Lack of financial infrastructure (e.g., banking systems). | "Our biggest barrier was the entire financial part of how to transfer payments. We needed to freeze a "security deposit" amount that we refunded to the user after the rental. However, several banks did not want to accept the system." Company D |
| | - Lack of access to financial services, lack of financial inclusion. | "[W]e required a credit card to make the rent, but only a small fraction of the population has a credit card . . . there are few cards in circulation right now." Company D |
| Internal theoretical categories. | | |
| Knowledge | | |
| Information on CE | - Poor understanding of the CE concept (e.g., not systemic, focused on isolated practices, not measuring its impact). | - "[W]ell, we do not collaborate with our bamboo providers (to achieve CE initiatives) I do not have data on how the bamboo (for the bikes) is obtained." Company B |

"[T]here are people who tell us: 'Hey, we like the bike, but it is costly do you sell other more affordable bamboo-items?'"

Company B

Company B also expressed that although their bikes incorporated environmental benefits, some people did not care and were more interested in the price.

"There are people who do not care. (about the environment) all they say is: 'your bikes are costly' These people are perhaps more interested in the bike's price there are others (people) that might not have the money to afford the product."

Company B

- Preference and demand: prevalence of a buy and own society

Although not a new finding, we considered it important to highlight this barrier due to its importance in the operating context as it could limit CE initiatives, specifically those linked to renting or leasing. On this subject, Company D did not consider the prevalent culture and societal behaviors as a possible limitation for their peer-to-peer rental business

model. Company D was operating in the context of a prevalent culture of “owning” a product, and where social status is often linked to property. The company failed to acknowledge the problem, which was one reason it failed to survive.

“One barrier was the culture or idea that ‘people are defined by their property,’ this part hit us very hard because people did not want to rent their things, even when they did not use them anymore... We have this culture of “owning” products. The more we have, the more we are.”

Company D

- Preference and demand: consumers’ skepticism and lack of trust

Complementing the previous point, other reasons for Company D’s failure involved the people’s skepticism and lack of trust, which increased consumer reluctance to rent their unused products through the platform—regardless of being offered insurance in case of damage or loss [23].

“There was a person we invited to use the renting app to rent its camping tent, and we asked him:

Company D: ‘Hey When was the last time you used your camping tent?’

User: ‘Three years ago.’

Company D: ‘Why don’t you rent it?’

User: ‘Because it is my tent, and then what if they break it or do something to it?’

That was a very high barrier, and we could not understand that kind of people. They do not use it anymore, they have not used it for about three years, and they will have another income. They have the idea that something will happen to their things, even though there is a guarantee that their things would get repaired or replaced if that was the case.”

Company D

Moreover, online platforms added another source for distrust. This last variable, of people distrusting online shopping, was also mentioned by Companies C and D.

“[P]eople like to touch and buy more than to see and buy. People do not know if the advertised product is real or not. This created uncertainty in the user.”

Company D

ii. Infrastructure

- Infrastructure irregularities

We confirmed that irregular or unavailable infrastructure (e.g., financial, waste management) could limit CE initiatives. For instance, in the Mexican context, a significant quantity of waste still ends up in landfills, as companies have no obligation to collect or recycle the materials—Mexico does not have an extended producer responsibility type of policy. This barrier was confirmed by Company E, which was working on a US project that uses textile waste as an input. Company E mentioned that the project in that country was feasible due to the regional conditions, as both infrastructure and legislation in the state were oriented toward gathering textile waste. The company added that due to the lack of collection mechanisms and infrastructure in Mexico, this project would not be feasible in this context, as they could not guarantee waste quantity and quality. Company E stated that one way to address this problem was to collect the waste directly from big generator industries to guarantee that concentrated textile waste in one place. The company stated,

“Interviewer: Does the company consider the available waste collection mechanism or infrastructure to propose solutions?”

Company E: Exactly. For instance, collecting textile would be problematic in Mexico . . . I mean, unless there was legislation or a mechanism to put a value on the textile waste to trigger collection centers’ emergence and prevent its dispersion. Its lack of value and

its dispersion limits the possibilities. In the bagasse case, we collect it directly from the generating companies, as they have massive concentrations of this waste. If it were the case that Mexico was a textile production pioneer, you know that if you go to a company (such as the case of beer in Mexico), they will have concentrated textile waste in one place. Nevertheless, this is not the case in Mexico, so that is why it is not a project that is being considered to be carried out in Mexico."

Company E

In summary, guaranteeing the volume of waste is essential for several CE initiatives. Moreover, in the context of emerging economies, we found that postconsumer waste availability in both quality and quantity can be minimal due to the lack of legislation or infrastructure, inhibiting many CE initiatives.

- Lack of financial infrastructure and lack of access to financial services

Additional aspects that we identified from the interviews were the lack of financial infrastructure and the lack of access to financial services as barriers. For instance, Company D is a peer-to-peer leasing company that required a specific financial system where the users needed to own a bank card to secure a deposit for renting a product. However, two main barriers emerged from this security deposit system. The first limitations were the national banks, as they refused to freeze the required security deposit amounts from credit cards.

"Our biggest barrier was the entire financial part of how to transfer payments. We needed to freeze a "security deposit" amount that we refunded to the user after the rental. However, several banks did not want to accept the system."

Company D

The second barrier mentioned by the interviewee was the low circulation of credit cards in the country.

"[W]e required a credit card to make the rent, but only a small fraction of the population has a credit card . . . there are few cards in circulation right now."

Company D

Supporting the information given by our interviewee, we confirm that while 61.5% of the Mexican population between 18–70 years own departmental credit cards, only 47.1% have a bank account, and only 33.8% of the population owns a credit card [96]. This factor limited their business model to a specific sector—those who own credit cards—a mismatch for their business model, which was oriented toward people who could not afford certain products. In this sense, the company failed to account for the lack of financial inclusion in its operating context.

Furthermore, the lack of financial infrastructure and inclusion affected the consumers and the SMEs at their founding stage. For example, Company B reported that they had to rely on personal and family loans to start the company. In some cases, such as Company D, financing came from a private investor that did not understand the business model and technology, limiting SMEs' flexibility to operate, which eventually led the company making incorrect business decisions and finally ceasing operations.

iii. Knowledge

- Poor understanding of CE

We asked all respondents questions about the CE, the tools and frameworks used by their companies, and the indicators used to measure their business models. Through these questions, we gained a better understanding of the interviewee's perception of the CE. From the responses, it became clear that most companies (except for Company E) have a partial understanding of CE. While describing what CE is, Company B stated

“I understand reuse or recycling. Back to the cycle. Have another transformation for a different use, that there is no end.”

Company B

Additionally, apart from Company E, all the companies mentioned that they do not use any framework or method to identify CE activities. Moreover, although all the companies can mention the economic, environmental, and sometimes the social benefits, most of them have not measured their social or environmental impact.

“We have not measured the environmental impact, but it could be measured using an environmental impact assessment.”

Company E

This was also observed in Company B.

“Interviewer: Any social benefit linked to the use of bamboo, and how do you measure it?”

Company B: Well . . . the benefit . . . I do not know how much it can be measured or how can I measure it . . . but the people who harvest the bamboo receive a benefit from taking advantage of their raw material”.

Company B

Finally, more than one company failed to incorporate the system’s thinking into their circular business models. For instance, Company C was still importing their raw material from China—although the company was researching how to fabricate the material in Mexico, this factor was not accounted for when the company presented its environmental impact comparison against traditional diapers.

“[W]e are a company that manufactures and distributes bamboo activated carbon cloth diapers... we still do not manufacture this cloth here in Mexico, we still import it from China.”

Company C

This was also the case for Company B, which ignored the agricultural practices carried out by farmers or how the bamboo was obtained.

“[W]ell, we do not collaborate with our bamboo providers (to achieve CE initiatives) . . . I do not have data on how the bamboo (for the bikes) is obtained.”

Company B

4.2.2. Leveraging Factors

This subsection focuses on answering the second research question, “How can SMEs in emerging economies leverage the implementation of CE initiatives through bottom-up approaches?” We describe some of the most highlighted themes and provide evidence for the new empirical enablers in Table 5.

Table 5. Empirical enablers absent from the literature review.

| External Theoretical Categories | Empirical Enablers | Evidence |
|---------------------------------|--|---|
| User’s Behavior | | |
| Budget | - Tackle users’ ability to pay through inclusive business models (e.g., leasing or renting), making products both affordable and accessible. | <i>“There are things that have to be rented and others that have to be bought . . . the social benefit was that renting customers did not have to spend much money to have access to a product . . . So, low-income people could access high-value products.” Company D</i> |

Table 5. Cont.

| External Theoretical Categories | Empirical Enablers | Evidence |
|--------------------------------------|--|---|
| Preference and Demand | <ul style="list-style-type: none"> - Tackle users' skepticism and lack of trust through a transparency strategy or the use of guarantees and certifications. - Tackle consumer's reluctance to change by proposing an added-value business model. Consumers are likely to switch if the product is better at tackling their problem. | <p>-"[W]e have a US certification that the bicycle works, of resistance . . . they (the consumers) trust a lot in the Americans." Company B</p> <p>"[O]ur clients have the purchasing power to own a car, but they decide not to use it, or they could choose not to use it because they have a bicycle that can solve the city mobility problem." Company B</p> |
| Infrastructure | | |
| Financial Infrastructure | <ul style="list-style-type: none"> - Use of supporting technologies that can be a substitute for the inadequate infrastructure (e.g., online payments). | <p>"We could never get the banks to freeze the "security deposit" amount required for rental . . . we had to find a different method that could guarantee payment. Thus, we rely on electronic promissory note . . . to protect rental products from damage or theft." Company D</p> <p>"One of the enablers was the technology and access to information. We looked for solutions on the internet or learned from other people who were developing similar platforms. We used a lot of collaborative economy success stories, we saw and used new practices, new tools, new technology that we could use, and we started applying that." Company D</p> |
| Internal theoretical category | | |
| Organizational | | |
| Organizational Capabilities | <ul style="list-style-type: none"> - Learning process and adaptability. | <p>"[L]earning to do it might be a barrier, but I do not see it as a barrier . . . I see it as part of the process. Learn to implement the technologies that exist." Company B</p> <p>"The project was reinforced . . . it changed as it received more advice, as more things were experienced." Company E</p> |

i. User's Behavior

- Budget: Tackling users' ability to pay through inclusive business models

As mentioned in the barriers section, our results pointed out that circular or sustainable products in the market are not affordable, and many users cannot access them. Our results identified that some companies generated inclusive business models in these regions to tackle this challenge by considering market constraints. For instance, Company D tackled the user's ability to pay problem through a peer-to-peer online-rental business model, where users could rent a product instead of buying it, allowing access to high-value products at a low price.

"[T]he social benefit was that customers did not have to spend much money to have access to a product . . . So, low-income people could access high-value products."

Company D

The idea of renting was not unique to Company D. Company B was planning to launch a bike renting program in Mexico City that would increase public access to their bikes while increasing the promotion of the product on the streets.

"I believe that the most important thing (about the renting program) is going to be the exposure that our bikes will have in the streets, and that exposure could translate into more sales."

Company B

Our results show that inclusive business models went beyond only thinking about consumers but considered including low-income people as producers, employees, or business partners along the value chain. This approach was followed by Companies B and A. For instance, Company B's bike-renting pilot program considered hiring students or seniors to give bike tours around Mexico City, providing them with an additional income. More noticeable, Company A trained and capacitated local people as carpenters; the company also helped them grow their business and become independent by providing affordable mechanisms to borrow or buy the needed technology.

"[W]e capacitated our teams, that without knowing the carpentry profession, now have learned it. We capacitated some people that used to work at night as warehouse workers. Now they already have that trade and can make a living from carpentry."

"[R]ight there in the workshop we have created spaces where we have been able to give lodging to the carpenters."

Company A

- Preference and demand: overcoming users' skepticism and lack of trust through transparency and certifications

As mentioned in the barriers section, our results show that consumers' skepticism and lack of trust were a common barrier for Companies B, C, and D. From our results, we observed that the companies tried to overcome this challenge through several means. For instance, Companies B and C had to rely on national and international certifications to appeal to consumers.

"People are the barrier ... the first thing people ask or the first thing they think is if the bamboo bike is resistant ... For those who believe the bike is not resistant, we have generated content to let them know otherwise. To let them know that we have US certifications that the bicycle works, of resistance ... they trust a lot in the Americans."

Company B

According to Companies C and B, these certifications lead to a change in the consumers' perception of the offered products. However, it was not only certifications that were enabling factors for the SMEs. Another critical enabler was transparency. Closely related to the certification process and its scrutiny, transparency in the whole manufacturing and sale process was reported as an internal enabling factor highly appreciated by the market.

"[I] do not know if it is luck or not, but customers have liked the brand. Also, they have shared through our webpage that they like that we are transparent and that we do not hide anything."

Company A

- Preference and demand: overcoming users' reluctance to change by proposing added-value business models

We found that some companies adapted their strategies and business models to better tackle consumers' needs, pains, or fears. For instance, Company C commented that they could not market their diapers through their environmental benefits, as people were not interested in the environment. In this sense, Company C opted to focus on long-term family savings and health to increase their sales; the strategy worked as their product could alleviate health problems associated with traditional diapers (e.g., skin rashes).

"In Mexico, there is a minimal culture of caring for the environment... most of our diaper sales are not motivated for environmental reasons ... thus, instead we are marketing the diaper based on the economic savings and the health aspect."

Company C

Although further implications need to be discussed, we found that consumers are likely to switch to a circular product if the product is better at solving their problems. For instance, Company B states,

"[O]ur clients have the purchasing power to own a car, but they decide not to use it, or they could choose not to use it because they have a bicycle that can solve the (Mexico) city mobility problem."

Company B

ii. Supply chain

• Collaboration

Although not a new finding, we considered it important to highlight this enabler. Our results show that all companies mentioned collaboration as an enabler for their initiatives.

"We talked about this project with the owner of the sawmill, and he understood the project, so he reserved all the wood scrap for us."

Company A

"[W]e are going to call it cooperation but in reality, it is like a "partnership" . . . an association . . . because we would not be able to offer all our current services alone. Our company offers sustainable innovation in different aspects, but to achieve this we need experts in each area."

Company E

Additionally, our results show that collaboration beyond the supply chain was also an important factor. These collaborations go beyond a traditional business to business relationship, for instance, in some cases companies reach out to federal agencies and non-governmental organizations (NGOs). In this sense, most companies collaborated with other organizations (e.g., NGOs, Universities, and Governments) to combine complementary capabilities. For instance, Companies C and E generated knowledge about transformation processes by cooperating with universities and research centers.

"Our company has an entrepreneurship area. For this part, we work with a company that is an expert in working with entrepreneurs and developing ideas into business models. In contrast, if we work with bioplastic or other technology, we go hand in hand with experts in such technology or reach out to scientists who have many years of experience working with a specific material or processes."

Company E

iii. Organizational

• Management: acknowledge the problem

Although not a new finding, we considered it important to highlight this enabler. From our results, we found that all the SMEs started as for-profit businesses with the motivation of finding a solution to a "wicked problem." For instance, solving deep-rooted contextual problems associated with city mobility, waste accumulation, or social exclusion.

"I was in various cities in France and Europe and saw many bicycles. That form of mobility within cities caught my attention. When I returned to Mexico, I was found again with all the cars, the traffic, the high fuel cost, the inefficiency in mobility, public transport, and . . . I decided that I wanted to implement the use of the bicycle."

Company B

Additionally, most companies claim to have started their SME due to one or more of the next motivations: for ethical purposes (e.g., environmental awareness or social responsibility), to earn economic benefits while simultaneously creating a shared value for society, the environment, or both.

"We aim to create wealth for our company, and our city-state, by generating decent jobs in Mexico and by taking care of the environment. Above all that, we wish to improve the lives of Mexicans... that our families become healthier, that they improve their quality of life and their purchasing power."

Company C

- Strategies: lobbying and consumers' education

Although not a new finding, we considered it necessary to highlight this enabler due to its importance in shaping and building regional enabling conditions. In this sense, our results show that one of the companies was involved in lobbying practices, Company C, working alongside the chamber of senators and the chamber of deputies to reach an agreement or develop a law regarding the use of disposable diapers.

"We are working with the chamber of senators and the chamber of deputies towards a law that aims to regulate disposable diapers . . . so these are no longer used in Mexico. In several countries, this is already the case."

Company C

On the other hand, increasing environmental literacy and awareness was a strategy developed by both Companies C and D, where they both focused on implementing sensibilization strategies via environmental education and awareness.

"[M]exico, has a minimal culture of caring for the environment. We have had to face reeducation of the population. We have done this through social networks."

"Reeducate people... To young girls, it is teaching them how to wash diapers. The benefits have been made known to them."

Company C

5. Discussion

Previous literature reviews, such as the ones performed by Govindan and Hasanagic [67], Bressanelli et al. [93], Shahbazi et al. [56], Ghisellini et al. [81], and Rizos et al. [12], identified the barriers and occasionally the enablers within a specific context. For instance, Ghisellini et al. [81] focused on identifying CE implementation challenges within the construction and demolition sector, while Rizos et al. [12] focused on barriers and enablers in European SMEs. Although the mentioned reviews were insightful, they did not provide answers to our research questions. Consequently, we designed a systematic literature review to support the creation of a codebook, which allowed us to compare our empirical findings. Moreover, instead of solely identifying barriers, our study focused on identifying enabling factors. In other words, this study has enabled us to identify internal and external barriers that SMEs in emerging economies face when implementing CE initiatives. In the following subsection, we discuss our findings and ground them in the context of our literature review and international research.

Our findings show that SMEs operating in emerging economies face several barriers linked to their implementing context and their company's size. Concerning the company size, Rizos et al. [12] mention that both large and small enterprises face barriers, albeit to different extents. For instance, Company D used available market technology to develop their platform. However, Company D was also limited by the existing online payment systems (i.e., Paypal) that, analogous to what happened with the banking system, did not accept their deposit scheme solution. These findings concur with previous studies, which state that SMEs often depend on available market technologies, while large companies can support technology development through R&D investments. Additionally, Companies A–D mentioned that financial resources represented a barrier limiting them from acquiring technologies or expansion opportunities; these results concurred with previous studies pointing to the fact that SMEs are often characterized by a lack of capital (i.e., human, finance, time), technology, or know-how [12]. Unfortunately, this limits the type of bottom-up solutions that SMEs can implement, specifically when working by themselves.

Additionally, and complementing our previous point, we found that collaboration was instrumental in overcoming the above limitations of SMEs. Our results showed that all the companies opted to collaborate through partnerships or alliances [12,84]. This factor is not new and has been mentioned by several authors [4,25]. In this sense, collaboration can maximize innovation capacities, solve specific industry problems, take advantage

of complementary strengths, and overcome individual weaknesses [84]. These findings concur with previous authors [12,84], who identified multistakeholder collaboration as an essential factor for CE implementation, specifically when working in the context of limited resources. Collaborative business models are also crucial for developing countries; as Mishra et al. [84] stated, collaboration can help overcome the lack of advanced technology, resource scarcity, and logistics [84].

Concerning the challenges of the implementing context, we need to highlight that, although both developed and emerging economies face barriers, the extent of their impact differs from one scenario to another [11,30,33]. In this sense, previous studies within both developed or emerging economies have identified barriers such as consumer behavior, legislative framework, and infrastructure barriers [29,33,85,87,93]. Nevertheless, said obstacles could become exacerbated in an emerging economy context, often characterized by the absence of legislation, the irregular or complete lack of infrastructure, and low environmental literacy [6,33,97]. In other words, our results corroborated that CE implementation is challenging, specifically in emerging economies where enabling conditions are still underdeveloped [3]. Thus, although it is not as simple for emerging economies to adopt CE initiatives from developed economies, implementing CE in this region is not an impossible task [3]. Achieving this requires aligning CE initiatives to the regional conditions such as the society's culture and prominent behaviors, infrastructure availability, and political and economic landscape [6].

Our results show that all the cases mentioned the role of the *user's behavior* for both boosting or deterring their initiatives. These findings indicate the importance of considering the user when designing CE business models [6]. Several authors have emphasized design as a core principle of CE, as design places human experience at its core [98]. In this sense, a better understanding of how people behave could avoid naïve business model designs, which might not progress otherwise [99]. Our results show that part of Company D's failure was linked to its poor understanding of its users, including the latter's trust issues and prevalent behaviors related to renting. As mentioned by several authors [99], circular initiatives need to address people's behavior, pain, attitudes, and the context of people's social lives [99]. For example, some circular initiatives require user collaboration, such as returning items to the stores or separating their waste. However, wrongly assuming there is a high environmental literacy among the population, for instance, expecting people to separate their waste or return packaging waste to stores voluntarily, could hinder CE implementation [99,100]. Building upon this, how could Company C guarantee that their biodegradable diapers would get buried after use instead of going to landfill? Thus, if the user is expected to be involved in a CE business model, a consumer analysis should be conducted to target market needs and prevalent consumer behaviors, as in the case of Company E, which carried out market trend analyses before proposing viable solutions. These analyses could also help companies tackle the entire product's life cycle and obtain the right nudges to encourage consumer participation, as mentioned by previous authors [11,99].

It is worth noting several aspects of the renting models. Sousa-Zomer et al. [6], who studied CE implementation in Brazil's manufacturing companies, confirmed that the sharing culture is more dominant in Europe and developed countries than in developing countries. Although we corroborated the culture of ownership in Mexico, we need to highlight some aspects. Company D stated that bicycles were their most rented item, followed by tools and electronics. In this line of thought, not all products might have the same reception for the rental business model. For example, it is common to rent dresses to attend wedding parties or events in some Mexican locations. However, this practice might not be as common for other products, which again emphasizes the need for consumer analysis. This conclusion can be partially corroborated by the study of Baxter et al. [60], which examined users' perceptions of used, manufactured, or shared objects and which mentions that the contaminated perception may change depending on the object.

Moreover, consumers' lack of trust was a prevalent issue in our study. Companies C and D mentioned that consumers prefer to "touch and buy rather than see and buy", owing to their distrust of online shopping. Though not corroborated in the context of CE, this finding concurs with several authors who mention that many consumers are skeptical about electronic commerce and the quality of the products offered online [101]. Another distrust source arises from the consumer perceiving equivalent products offered in the market but based on CE (e.g., using different materials) as high-risk and uncertain. This situation is widely known in emerging economies, where customers have the same feelings toward "green products" [102]. These results are aligned with Govindan and Hasanagic's [67] study, which found that consumer perception toward remanufactured and reused products was a barrier, as consumers prefer virgin products. These results only emphasize the need to offer demonstrations about product reliability, offering warranties, or a behind-the-scenes look of the firm's processes and quality control mechanisms to enhance people's trust [14,85].

From our results, we also confirmed that circular or sustainable products that account for a firm's negative externalities or have a longer life are usually more expensive, which might deter people from buying the products, as was the case with Company B [23]. According to some authors [57], the price is the biggest driver in making a buying decision. In this sense, we confirm that, in some cases, companies stated that consumers were less willing to buy more expensive products, regardless of their positive externalities, either because they cannot afford them or because they are not willing to pay for them [57,93]. In this regard, designing inclusive business models might provide a solution for financial inclusion and consumers' ability to pay, such as renting business models (e.g., Company D). Additionally, a value-added business model might nudge some consumers to switch to circular products, specifically if they are better at solving their problems (e.g., mobility), such as in the cases of Companies B and C.

In the case of *regulation*, we corroborated our findings with the existing literature [15,29,32]. The research performed by Rizos et al. [12] detailed that the lack of adequate legislation is a significant barrier that often impedes European SMEs from integrating "green" solutions in their operations, which could be the case of many Mexican firms. Additionally, factors such as regulations or tax incentives can counteract users' behavior challenges [15,29,32]. For instance, consumers are likely to switch to a circular product if noncircular products have higher prices than their counterparts; thus, taxation on virgin resources might provide this advantage [85]. For example, Sweden offers tax breaks for people to repair items such as shoes, clothes, or bikes [103]. Thus, a strong regulation could promote the external conditions to develop and encourage circular initiatives by providing a fairer competition. Unfortunately, emerging economies have often been characterized by the absence of strong legislation toward CE [25,33]. There is a lack of strong policies oriented toward waste management, extended producer responsibility, circular product design, circular procurement, and other "circular" supporting policies [61]. These types of regulations could have provided most of our case studies with a competitive advantage. It was not surprising to observe that Company C was lobbying to regulate disposable diapers, as this could give them a competitive advantage over its competitors in the future.

Our results also confirm a key barrier often present in these contexts—*unavailable and irregular infrastructure* [6,33]. In this respect, some studies have found that infrastructural irregularities are typical in developing and emerging countries [6,31]; this may include, but is not limited to, the water network, electricity, transportation, and roads or the waste management infrastructure [6,31]. For instance, Casiano et al. [29] found that public resources were so limited in Mexico that the government could not build infrastructure for water utilities. On the other hand, Sousa-Zomer [6] found irregularities in the water network across Brazil, which inhibited adoption of a new CE business strategy. Our case confirms that Mexico's waste management system is still underdeveloped; thus, much waste gets mixed-collected and landfilled [104]. The ineffective collection, separation, and recovery infrastructure lead to waste dispersion [61]. Consequently, companies cannot

guarantee waste quantity or quality, and the circular initiatives become limited—such was the case of the textile example of Company E. These findings were also confirmed by previous authors [6,31]. As a solution, Company E decided to source waste directly from the generators, avoiding the barrier of collecting widely dispersed waste.

Our study reveals a new finding not mentioned in the CE literature review. We found that financial infrastructure was still highly underdeveloped in Mexico, preventing the population from accessing financial services such as credit cards and loans. This barrier has a major repercussion in creating new SMEs, often self-financed (e.g., Company B's case). These findings also concur with Méndez [37], who analyzed Mexican SMEs' characteristics and found that they are usually funded by their own money. Moreover, a lack of consumers being financially included limits consumers' participation within new business models (e.g., Company D's case) [37]. Company D addressed this barrier by using the available—but often limited—market technology (e.g., electronic promissory notes). In these cases, technology might leverage the inadequate infrastructure to some extent, such as has been observed in other countries—for instance, companies using mobile technology to establish a system of mobile banking [97].

Regarding internal factors, we found that some of these founders or CEOs have specific characteristics of change agents [57,59]. For instance, through their high proactivity, perseverance, and relentless leadership, we found that they overcame much of the internal and external barriers. This was partially possible by creative thinking, acknowledging the problem's complexity, and learning and adapting to the environment. However, we also found that most founders are still missing key characteristics of a truly circular ecosystem. In this sense, we observed an inadequate understanding of circularity in some firms. For instance, some of their solutions were not system-oriented—for example, they did not consider raw material procurement [57]. These results are in concordance with previous studies that identified barriers such as the lack of understanding of CE principles or its holistic approach [57,66]. The importance of system thinking has also been emphasized by several authors [81]. From our results, we identified that the companies did not design the CE initiatives in conjunction with their negative externalities nor measured their circularity or sustainable impact. Some authors, such as Peralta et al. [90], have stated that it is imperative to quantify and evaluate CE projects to open the possibility of continuous improvements. Measuring becomes essential to ensure the initiative's alignment with the company's strategy and to track its intended impact [90].

Finally, it is essential to highlight a transversal topic. Accounting for the regional conditions must become a firm's priority when designing CE business models under these contexts. In this sense, using the ReSOLVE framework would not be enough to design inclusive CE business models. As an alternative, Scheel [105] proposed the Sustainable Wealth creation based on Innovation and Technology (SWIT) framework, an approach based on a holistic vision capable of articulating resources, conditions, and synergies to transform them into valuable systems. The SWIT integrates CE and system thinking principles and can be implemented under hostile regional conditions, such as emerging and developing economies [105].

6. Conclusions: Learning from Failure and Success

CE implementation has often been regarded as a straightforward process whereby emerging economies can implement best practices drawn from developed countries. However, successful implementation of a CE requires a disruptive systemic change and cannot be carried out without considering the regions' contextual particularities. Although this paper acknowledges that a concurrent approach between top-down and bottom-up strategies is required to accelerate this transition, we focused on answering how SMEs implemented CE in emerging markets where conditions are often lacking. In addition, this study also identifies the barriers faced by SMEs when implementing CE initiatives.

The study found that CE implementing barriers can be further exacerbated by the business model's lack of fit with its operational context. We found that our study's un-

successful company failed to acknowledge and align to the market's particularities, such as the financial infrastructure or the customers' preference. The case failure also resulted from the lack of financial inclusion, a predominant problem in Mexico. On the other hand, successful circular initiatives aligned their business models to contextual conditions. In this sense, SMEs should consider the national context's specific attributes, such as the available infrastructure, the current regulations, or consumer characteristics. For instance, designing inclusive business models might provide a solution for financial inclusion and consumers' ability to pay. Other observed enabling strategies include collaboration across different actors (e.g., government, universities) and building partnerships, which proved to be critical for CE's successful development and implementation.

Our results suggest implications that apply to theory and practice and to a broad range of stakeholders. The present research findings have relevant theoretical implications. On the one hand, it contributes to a growing literature focused on implementing CE beyond developed countries. On the other hand, it presents the first systematic literature review on this topic, highlighting barriers and enablers faced by SMEs in emerging economies. Moreover, it also has an important practical implication for governments, policymakers, businesspeople, entrepreneurs, and decisionmakers.

For governments, the importance of creating enabling conditions is paramount. Contrary to a top-bottom implementation approach, which is usually seen in developed countries, governments and policymakers in emerging economies have to acknowledge the importance of their role in creating these conditions. Without these proper conditions, these regions could lag behind the circular transition. In this sense, our results could provide a steppingstone to guide them toward developing infrastructures and designing policies that support both the CE and the proliferation of these practices in SMEs.

Moreover, entrepreneurs and businessmen's implications in creating a CE-based company or spinoffs are manifold, as the numerous empirical barriers and enablers identified suggest. Affordable prices, consumer market analysis, transparent communication, and collaboration are among the most salient ways to overcome the limitations posed by emerging economies' environments and cultures.

Finally, our findings provide lessons from both failing and successful CE initiatives implemented by SMEs in emerging economies. We found that it is possible to implement CEs only when the business designer has a systemic vision, the capabilities to identify and achieve valuable synergies among all key stakeholders, and the capacity to align to the region's enabling conditions. Without considering this leverage, it is almost impossible to design circular business for SMEs in emerging economies. The insights are particularly relevant to shedding light on a previously underexplored research area that continues to affect the adoption of CE principles by SMEs in emerging economies.

Limitations and Future Research

While trying to identify CE case studies to write this article, it became clear that the concept is still gaining traction in the region, as is the case with many other emerging economies. In this sense, poor understanding of CEs translates into companies failing to incorporate system thinking into their business model, increasing the possibility of adverse effects in their environments and failure. Therefore, one of the study's limitations was selecting the cases based on meeting the ReSOLVE framework rather than using a more systemic approach. Future research should consider using a more appropriate framework that might help develop CEs within emerging and developing economies, such as the SWIT framework which includes all required stakeholders and allows firms to become engaged in a functional circular environment. Furthermore, studying additional circular examples could bring a more balanced perspective on both barriers and enablers of CE implementation.

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Appendix A

Circular Economy implementation questionnaire

Dear respondent,

We appreciate the time you are taking to answer the following questionnaire. As researchers, we value the information you provide as an input to advance our understanding of what firms are doing to preserve natural resources and, at the same time, create value for different stakeholders.

—Summary of background information—

The objective of this questionnaire is to identify:

- Identify which of the following activities have been used to some extent in any business unit of the firm:
 - i. Regenerate: regenerating and restoring natural capital (e.g., shift to renewable energy and materials, restore the health of ecosystems).
 - ii. Share: maximizing asset utilization (e.g., renting equipment instead of owning it).
 - iii. Optimize: optimizing resources and systems performance (e.g., optimize energy and resources used).
 - iv. Loop: keeping products and materials in cycles (e.g., remanufacturing or recycling).
 - v. Virtualize: displacing resource use and delivering utility virtually (e.g., online shopping, dematerialize directly—replacing books or movies).
 - vi. Exchange: Applying new technologies, choose new products or services (e.g., 3D printing).
- Identify what economic, social, and environmental benefits have directly generated CE practices, indicating how these benefits have been measured.
- Identify what internal and external barriers and enablers for CE implementation.

Warmup-context background

1. What is your understanding of the Circular Economy?
2. How many employees does your firm have?
3. In which industry does your firm operate?
4. What is your role in the organization (responsibility and hierarchy level)?
5. How long have you worked in _____?
6. What is your professional experience?

Circular Economy practices following the ReSOLVE framework

Has your firm implemented practices related to CE regeneration? For example: Such as shift to renewable energy and materials.

If the answer is yes:

7. What activities has your firm implemented related to regeneration CE practices?

8. What internal factors have facilitated the implementation of regeneration practices in the firm?
9. What external factors have facilitated the implementation of regeneration practices in the firm?
10. What barriers did the firm have to overcome to implement regeneration practices?
11. What are the economic benefits? How do you measure them?
12. What are the social benefits? How do you measure them?
13. What are the environmental benefits? How do you measure them?

If the answer is not:

14. Did your firm try to implement regenerative CE practices and was not successful?
15. What barriers have impeded the implementation of regenerative practices in the firm?

Note: These questions were asked for every initiative within ReSOLVE (Regenerate, Share, Optimize, Loop, Virtualize, and Exchange). Examples were given for each initiative.

55. Has your firm implemented any other practice that you consider related to CE that was not mentioned above?

Additional information on support

56. Do you cooperate with suppliers for achieving the implementation of CE practices? If yes, in what activities? How?
57. Do you cooperate with customers to achieve the implementation of CE practices? If yes, in what activities? How?
58. Did you use any method to identify and implement CE activities? E.g., a consulting firm.
59. What was your motivation to implement CE practices?
60. To your understanding, what is the relationship between CE and sustainability?
61. What has been your overall experience with the implementation of CE in your company?
62. Do you have anything else you want to add?

Note: The questionnaire was written and carried out in Spanish. The translation to English was carried out for the sole purpose of this article.

Appendix B Case Summaries

Company A manufactures wooden products such as toys out of certified and rescued wood. The company begins by obtaining rescued wood destined to be shredded, burned, or landfilled. In addition to the rescued wood, the company uses Forest Stewardship Council (FSC) certified wood to ensure that the wood comes from responsibly managed forests. The company's objective is to make a long-lasting product. To support this idea, they provide a product repair and restoration area. After the toy life cycle finishes, founders expect that each piece could also serve decorative purposes, as pieces are considered to be artwork. In fact, some Mexican museums sell these products. In the worst case, if the toy is no longer needed, it can be disposed of responsibly, as it is made out of toxic-free substances and mostly uses water-based coatings.

Company B manufactures bamboo frames and assembles city, road, and mountain bicycles. The company manufactures bicycles using nationally sourced bamboo and carbon fiber. The advantage of using bamboo over other materials is that bamboo generates 30% more oxygen than trees, and the plant is harvested by pruning its branches. The company also gives workshops in which customers can assemble and manufacture their bikes. It also provides mechanical services, where the bikes can be repaired or given maintenance, and sells spare parts online. Additionally, depending on their quality, old pieces can be reused for the same or for alternative purposes, such as making keychains.

Company C manufactures eco-friendly diapers made out of bamboo charcoal and cotton cloth. The diapers are made with certified organic materials and are designed to be adjustable (one-sized), fully washable, and reusable. The diapers have a lifespan of three years and are home compostable, as they can biodegrade in eight months. The

company calculates that using their product could increase families' savings by up to 90% and that their product could also increase environmental benefits. For instance, their study calculated that a baby uses about 7000 disposable diapers in their first years of life and that one diaper can take up to 500 years to degrade. Therefore, Company C avoids generating 1 ton per user of waste per year and avoids cutting three mature trees per user per year for the manufacturing of disposable diapers.

Company D is the polar sample of our case studies, which means that it dissolved after operating for 1.5 years. The company launched a peer-to-peer rental app. Users could upload photos of their belongings and set the rental price. Moreover, Company D insured all rented products. On the other hand, renters could browse a wide diversity of products such as sport and camping gear, video games, or tools. Renters could also search by geolocation and make the payment directly through the app. Some of the mentioned advantages associated with the platform were: providing renters with access to experiences or products without having to purchase or spend a large amount of money. The platform had the potential to improve the access of low-income populations to a diversity of products. Moreover, users could rent their low-usage products for the needed time. This renting scheme could have prevented consumers from buying additional products and avoid further waste.

Company E is a Mexican company that aims to redesign and rethink sustainable product development. The company also conducts consultancy work to create sustainable innovation and support the transition to a circular economy. The company has three areas. The first area is "waste into wealth", which uses waste to create and develop viable products with environmental and economic benefits (e.g., the company developed a bioplastic from brewing organic waste). The second area connects the industry with entrepreneurs to develop circular entrepreneurship models tailored to the industry's needs. The third area is the circular transformation service; it offers consultancy and guidance for medium and large companies to generate feasible and scalable circular strategies.

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