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**EXPLORING THE SYNERGISTIC EFFECTS OF  
STAKEHOLDER PRESSURE, COLLABORATION, AND  
CIRCULAR ECONOMY PRACTICES IN ESTONIAN  
MANUFACTURING SMES**

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## **ABSTRACT**

Within the context of this thesis, the adoption of circular economy (CE) practices within manufacturing small and medium-sized enterprises (SMEs) in Estonia is being investigated. The main focus is on the interplay of stakeholder pressures and collaborative efforts. Through an extensive review of the literature, the study identifies key factors influencing CE adoption, including stakeholder pressure, collaboration dynamics, and contextual considerations. The research employs Fuzzy-set Qualitative Comparative Analysis (fsQCA) and Configurational Theory to analyze data and identify three distinct pathways influencing CE adoption: demand side collaboration, social pressure without business pressure, and business pressure with supply-side collaboration. These findings underscore the significance of stakeholder engagement, collaboration across the supply chain, and contextual adaptation in driving CE practices within SMEs. The study offers valuable insights for SMEs seeking to transition towards CE practices, emphasizing the importance of strategic stakeholder engagement, collaboration, and context-specific approaches to sustainability. By integrating CE principles into their operations, SMEs can enhance competitiveness, contribute to environmental sustainability, and foster societal well-being.

Keywords: Circular Economy, SMEs, stakeholder pressure, collaboration, fsQCA.

## **ABBREVIATIONS**

B2B – Business-to-business

B2C – Business-to-consumer

CAM&R – Corporate asset management and recovery

CE – Circular economy

CSCs – Circular supply chains

CSR – Corporate social responsibility

EC – Environmental commitment

fsQCA – Fuzzy-set qualitative comparative analysis

GEIs – Green economic incentives

NGOs – Non-governmental organizations

SMEs – Small and medium-sized enterprises

SO – Sustainable operations

QCA – Qualitative comparative analysis

## **INTRODUCTION**

Sustainability has emerged as a paramount concern in contemporary business discourse, driven by the urgent need to address global environmental challenges such as climate change, resource depletion, and environmental degradation (Miroshnychenko & De Massis, 2022). Alongside it, the concept of the circular economy (CE) has gained traction. Similar to sustainability, the transition to a CE entails rethinking traditional business models and practices to minimize waste, maximize resource efficiency, and extend the lifespan of products and materials (Ahmadov et al., 2023). This recognition has been spurred by a mounting awareness of the intricate and far-reaching interdependencies between business activities and the resulting environmental and social outcomes. It is increasingly evident that the actions of businesses, irrespective of their size or sector, play a significant role in shaping the environmental landscape and social fabric of communities worldwide. Therefore, the imperative to integrate sustainability principles into business operations has become ever more pressing (Gennari, 2022; Zucchella et al., 2022).

Businesses across industries are progressively acknowledging the imperative of integrating sustainability principles into their operations to mitigate environmental impact, enhance resilience, and ensure long-term viability (Eweje, 2020). By adopting sustainable practices, businesses aim to not only minimize their negative environmental footprint but also to enhance their competitive advantage, foster innovation, and secure their license to operate in an increasingly conscientious marketplace.

Within the vast landscape of business entities, small and medium-sized enterprises (SMEs) hold particular significance. SMEs constitute a substantial portion of the global economy and are recognized as engines of innovation, employment generation, and economic growth (Bakos et al., 2020).

However, despite their pivotal role, SMEs face unique challenges in adopting and implementing sustainable practices. SMEs are often characterized by limited resources, operational constraints, and varying degrees of environmental awareness, which pose hurdles in embracing CE initiatives

(Ahmadov, 2023; Knoth et al., 2022). Unlike large corporations with dedicated sustainability departments and ample financial resources, SMEs must navigate these challenges with limited personnel, expertise, and financial capacity (Martins et al., 2022).

In understanding the dynamics of CE practices within SMEs, it becomes obligatory to explore the influencing factors that shape their sustainability practices. These factors encompass a spectrum of internal and external elements, ranging from organizational dynamics to market forces and stakeholder pressures (Castro-Lopez et al., 2023). Internally, factors such as leadership commitment, organizational culture, and innovation capabilities play pivotal roles in enabling SMEs to embrace sustainability and integrate it into their core business strategies. For example, SMEs with strong leadership commitment to sustainability often exhibit a clear vision and strategic direction towards adopting eco-friendly practices, while those with a culture of innovation tend to be more agile in implementing sustainable solutions (Mendes et al., 2022).

Externally, regulatory frameworks, market demand for sustainable products, and access to financing emerge as significant drivers or constraints for SMEs' initiatives towards CE practices. SMEs operating in regions with strict environmental regulations may face compliance challenges but also opportunities for differentiation and competitive advantage through sustainable innovation (Mendes et al., 2022). Moreover, stakeholder pressure and collaboration emerge as critical determinants shaping sustainability practices within SMEs. Stakeholders, including customers, suppliers, employees, investors, and regulatory bodies, exert influence on SMEs' sustainability agendas through expectations, demands, and incentives (Ahmadov et al., 2023).

The pressure from stakeholders compels SMEs to adopt and adhere to CE practices, aligning their operations with societal and environmental expectations (Ernst et al., 2022). For instance, customers increasingly prefer products and services from companies that demonstrate environmental responsibility, thereby stimulating SMEs to invest in sustainable production processes and green technologies (Pereira & Franco, 2023). Concurrently, collaboration among stakeholders, both within and beyond the organizational boundaries, facilitates the exchange of knowledge, resources, and expertise necessary for implementing sustainable initiatives. Collaborative efforts between SMEs and suppliers, for instance, can lead to the development of eco-friendly supply chains, reducing carbon emissions and waste throughout the production process (Akpan et al., 2023).



While existing literature provides valuable insights into the complex relationship between stakeholder pressure, collaboration, and CE practices in SMEs, it also underscores the presence of notable gaps and challenges that necessitate further exploration (Ahmadov et al., 2023; Alyahya et al., 2023). Globally, SMEs constitute approximately 90% of all businesses (The World Bank, 2023), a figure that rises to 99% in the EU (European Commission, 2023). Despite their undeniable economic significance, SMEs also pose environmental challenges, particularly pronounced in nations like Estonia. Here, indicators for eco-efficiency and eco-innovation lag behind those of other EU members (Yamasaki et al., 2021; European Commission, 2023).

In this context, Fuzzy-set Qualitative Comparative Analysis (fsQCA) and Configurational Theory emerge as particularly promising means for research, offering comprehensive perspectives and analytical tools to delve into the complexities of sustainability in SMEs. Kumar et al. (2022) highlight the potential of this methodology in providing detailed insights, such as into the interplay between stakeholder pressure, collaboration, and sustainable performance within SMEs.

A large number of academic literature and prior research discusses the role of stakeholder pressure, collaboration, and government policies in driving the adoption of CE practices in SMEs (Ahmadov et al., 2022; Hernández-Arzaba et al., 2022; Jabbour et al., 2020; Suchek & Franco, 2023). Stakeholder pressure, both from corporate entities and societal perspectives, is highlighted as a motivating factor for SMEs to engage in Corporate Social Responsibility (CSR) activities and implement CE practices (Baah et al., 2023). Collaboration among stakeholders, including government bodies, NGOs, suppliers, and customers, is emphasized as essential for supporting sustainable development initiatives in SMEs and overcoming barriers to CE adoption (Permatasari & Gunawan, 2023; Suchek & Franco, 2023).

Therefore, the primary objective of this study is to explore the synergistic effects of stakeholder pressure, collaboration, and CE performance within the specific context of Estonian SMEs. By drawing upon the methodological strengths of fsQCA and the conceptual framework provided by Configurational Theory, the research endeavors to explain the configurations of factors that lead to enhanced sustainability outcomes in SMEs. Building upon the methodological and theoretical foundations, this study aims to address the following research question:

What are the configurations of stakeholder pressure and collaboration that facilitate better circumstances for the adoption of CE practices in Estonian manufacturing SMEs?

This research question encapsulates the central inquiry driving the investigation into the synergistic effects of stakeholder pressure, collaboration, and CE performance. By examining the specific context of Estonian manufacturing SMEs, the study seeks to uncover context-specific insights and practical implications that can inform policy interventions, managerial decision-making, and scholarly discourse on SME sustainability (Ahmadov et al., 2023; Chowdhury et al., 2022). This study aims to contribute to both theoretical understanding and practical implications for SMEs aiming to navigate the path towards CE practices. Through the integration of fsQCA methodology and Configurational Theory, it seeks to offer insights into the intricate dynamics at play within SMEs, thereby facilitating more informed decision-making and strategic interventions in the pursuit of sustainable business practices.

The thesis can be divided into three main parts. The first part involves an extensive examination of the existing literature on the impact of stakeholder pressure, the significance of collaboration, and CE practices, with a particular emphasis on their relevance to SMEs. The second part explains the research design and methodology chosen for the study, based on the sample and research setting. Lastly, the third part of the thesis presents the data analysis results and a discussion of the findings, along with recommendations and suggestions for future research.

# **1. LITERATURE REVIEW**

## **1.1. Circular Economy Practices in SMEs**

SMEs are important to the economy of the entire world because they provide major contributions to employment, innovation, economic growth, and the promotion of diversity in business ecosystems (Ahmadov et al., 2023; Durst & Bruns, 2018; Tsvetkova et al., 2020). According to Tereshchenko et al. (2023), the significance of SMEs is further highlighted by their adaptability and the capacity to promote eco-innovation and green growth. This places them in a position to be essential actors in the transition towards more sustainable and CE models.

The practices of the CE, which strive to improve resource efficiency and decrease waste, are becoming more acknowledged as a strategy to boost the sustainability performance of enterprises. In the first place, SMEs constitute a sizable share of the gross domestic product (GDP) in Europe and play a crucial role in the transition from a linear to a CE (Gennari, 2023). Because of their close connection to local ecosystems and workforces, they are in a privileged position to speed up the transition to a more environmentally friendly global economy.

Incekara (2022) asserts that the implementation of CE practices by SMEs can result in improved environmental performance utilizing greater energy and resource efficiency as well as waste reduction. This is in line with the Sustainable Development Goals established by the United Nations organization. The implementation of CE practices in SMEs has the potential to improve sustainable performance in a variety of critical areas of action, including design, procurement, manufacturing, distribution, consumption, and recovery. Journeault et al. (2021) found out that SMEs that have engaged in sustainable development initiatives have been able to significantly reduce their social and environmental impact while improving their financial performance. These initiatives also have strategic benefits, such as promoting brand image, facilitating staff recruitment and retention, and ensuring long-term viability.

According to Arsawan et al. (2023), the transition to CE within SMEs is supported by a number of factors. These factors include green economic incentives (GEIs) and environmental commitment (EC), which are the driving forces behind CE practices. These practices can be mediated by internal environmental management, eco-design, and corporate asset management and recovery (CAM&R). Furthermore, one of the most important factors in the effective execution of company strategies that are essential for the expansion of small and medium-sized enterprises (SMEs) is human resource management (Ray, 2022).

However, the adoption of CE principles in SMEs is still just emerging, and there is a need for systemic research from the SME perspective. In their studies, Rittershaus et al. (2023) note how SMEs often lack the financial and organizational resources to implement systemic changes to their business models. Moreover, oftentimes there is still a lack of clear legislation and support from government bodies and other legislative bodies to succeed in implementing sustainable practices in SMEs. The lack of regulatory frameworks hinders the implementation and promotion of such practices (Mourselleas et al., 2022). Therefore, it is essential to provide SMEs with practical tools and methodologies that facilitate business model innovations towards circular value creation (Rittershaus et al., 2023).

Governments can foster conditions that enable niche innovations to scale and displace established linear regimes by providing supportive programs and policies (Maher et al., 2023). Policy instruments such as command-and-control regulation and technology-push instruments have been found significant in stimulating SMEs' adoption of CE innovations (Ren & Albrecht, 2023).

Moreover, Baah et al. (2023) have identified certain obstacles that hinder the implementation of CE practices in SMEs, such as stakeholder pressure, originating from both corporate and societal perspectives. Stakeholder pressure can motivate SMEs to get more involved in Corporate Social Responsibility (CSR) by implementing CE practices. This pressure forces businesses to be more innovative and collaborative, ultimately improving their engagement in CSR. This is especially relevant because SMEs frequently encounter limited resources and depend on stakeholder networks to get external resources (Baah et al., 2023).

Collaboration is an essential element in effectively implementing CE principles. External stakeholders play key roles in supporting sustainable development initiatives in SMEs. These

stakeholders provide support in terms of awareness, information, time, financial resources, skills, and expertise in sustainable development (Journaeault et al., 2021). Cooperatives exemplify how cooperation among members and local communities may enable the sharing of knowledge and resources required for implementing Circular Economy practices. Such collaboration promotes sustainable management of resources and creates potential for growth (Savga et al., 2023). Furthermore, it is encouraged to establish knowledge-sharing strategies and collaborative working groups focused on the circular economy inside and among SMEs in order to develop sustainable business organizations (Chowdhury et al., 2022).

As an example, Chowdhury et al. (2022) highlight the significance of stakeholder pressure in driving the adoption of CE practices in Indian SMEs. Their research reveals that government efforts, competitive advantage, environmental legislation, and consumer pressure are key factors influencing the adoption of CE in these businesses. Research conducted by Arsawan et al. (2023) demonstrates that green economic incentives and a strong environmental commitment have a favorable impact on the adoption of CE practices in SMEs. The study also found that the link between incentives and practices is mediated by the level of environmental commitment.

## **1.2. Role of Stakeholder Pressure**

Stakeholder pressure has a substantial impact on the adoption of Circular Economy (CE) practices, as stakeholders have a critical role in driving organizational transformation towards sustainability. Stakeholder involvement is recognized as a crucial factor in facilitating the shift to a circular economy, especially in industrial firms, where transitioning from a linear to a circular approach to stakeholder engagement is imperative (Fobbe & Hilletoft, 2023). This entails broadening the scope of individuals and groups involved, enlarging the topics addressed, and enhancing the means used for participation. A study done by Jiao et al. (2020) suggests that primary stakeholder pressure has a significant impact on sustainable operations (SO) adoption, while governmental pressure and secondary stakeholder pressure do not have a significant effect.

According to various other studies, both commercial and social stakeholder pressures have a considerable impact on the adoption of circular economy strategies. Various business stakeholders, such as consumers, suppliers, and investors, apply pressure on companies to implement CE practices in order to improve their brand reputation, financial performance, and

competitive advantage (Mazzucchelli et al., 2022; Subarmanim & Chin, 2022). Hernandez-Arzaba et al. (2022) assert that social stakeholders, including non-governmental organizations (NGOs), the public, and the government, have a significant impact on promoting environmental sustainability and exerting pressure on companies to embrace circular economy ideas.

Research has demonstrated that the influence exerted by stakeholders may function as both an obstacle and an incentive for the implementation of Circular Economy (CE) practices. External stakeholder pressures, such as those exerted by consumers and regulatory organizations, have been shown to have a positive impact on economic and environmental performance by encouraging the adoption of CE concepts. Likewise, internal constraints from stakeholders, although not directly impacting environmental performance, motivate the implementation of circular economy strategies that can result in enhanced environmental results (Hernandez-Arzaba et al., 2022). A study done by Bello-Pintado et al. (2022) highlights the importance of involving all major stakeholders in advancing sustainability practices. Pressures from government and regulations, NGOs, shareholders, customers, employees, and top management all play a role in determining the adoption and implementation of sustainability practices.

Moreover, the influence of stakeholder pressure varies among different types of organizations. Rodríguez-Espíndola et al. (2022) stated that in the context of small and medium-sized enterprises (SMEs), stakeholder pressure, specifically from government support and customer demand, plays a vital role in the implementation of circular economy (CE) practices and sustainability-focused innovation. This, in turn, has a positive effect on the financial, environmental, and social performance of these enterprises. Research conducted by Courrent and Omri (2022) has demonstrated that stakeholder pressure has a beneficial impact on the dedication of SMEs to implementing sustainable business practices.

In addition, the study conducted by Neri et al. (2023) on Italian SMEs highlights the importance of digital technologies in adopting circular economy (CE) practices. The study suggests that the effectiveness of these practices may be enhanced by leveraging the potential synergies among different technologies, emphasizing the need for a collaborative approach in utilizing technology. The research conducted on small and medium-sized enterprises (SMEs) in Malaysia suggests that partnering with corporate stakeholders may improve the company's reputation and support economic and environmental sustainability by using solar photovoltaic technology (Hsbollah et al., 2023).

The need for cooperation is apparent in the context of green economic incentives and environmental commitment. In order to enhance environmental awareness and sustainability, it is essential for the government, SMEs, and the community to engage and work together (Arsawan et al., 2023). A study done among Chinese manufacturing firms shows that stakeholder pressure, managerial perceptions, and resource availability are key factors influencing the adoption of SO (Jiao et al., 2020). In addition, the study conducted in the construction sector suggests that in order to achieve organizational growth and transition towards a circular economy, collaboration is necessary in areas such as logistical infrastructure and market share (John et al., 2023).

### **1.2.1. Developing Propositions 1 and 2**

Based on the literature examining stakeholder pressure and its implications for the adoption of CE practices, the following propositions are introduced to investigate their applicability in the context of Estonian manufacturing SMEs. Drawing from studies that underscore the significant impact of stakeholder involvement, particularly from both business and social spheres, on driving the organizational transformation towards sustainability (Fobbe & Hilletoft, 2023; Hernandez-Arzaba et al., 2022), it is argued that understanding the dynamics of stakeholder pressure is crucial for elucidating the adoption of CE practices among manufacturing SMEs in Estonia.

*Proposition 1. Business Pressure is positively associated with the adoption of Circular Economy practices in Estonian manufacturing SMEs.*

In Proposition 1, it is posited that Business Pressure, encompassing pressures from consumers, suppliers, and investors, is positively associated with CE adoption in these SMEs, given the imperative for businesses to enhance competitiveness and meet market demands through sustainability practices (Mazzucchelli et al., 2022; Subarmanim & Chin, 2022).

*Proposition 2. Social Pressure is positively associated with the adoption of sustainability practices in Estonian manufacturing SMEs.*

Likewise, in Proposition 2, it is contended that Social Pressure, emanating from socially conscious stakeholders such as NGOs and the public, positively influences CE practices,

reflecting the growing influence of environmental and social responsibility considerations on firms' decision-making processes (Hernandez-Arzaba et al., 2022). By framing the propositions within the context of existing literature, the aim is to provide a solid foundation for future empirical investigation into the role of stakeholder pressure in shaping CE adoption among Estonian manufacturing SMEs.

### **1.3. Role of Collaboration in CE Practices**

The role of collaboration, both on the supply side and demand side, is pivotal in the adoption of Circular Economy (CE) practices in manufacturing SMEs. It plays a crucial role in improving sustainability performance in circular supply chains (CSCs) and implementing circular economy strategies (Sudusinghe & Seuring, 2022). As per Köhler et al. (2021) and Luthra et al. (2023) cross-sectoral collaboration can support advancing circular economy practices by developing knowledge-sharing routines and ecocentric dynamic capabilities. Soni et al. (2023) suggest that collaboration, including power-sharing, delegation, decision-making, authority-sharing, and a collaborative mindset, facilitates the adoption of circular economy (CE) practices. Therefore, distributed leadership, which emphasizes collaboration and collective vision, can be a catalyst for building a collective and aligned vision of CE implementation.

Collaboration is essential for SMEs to implement circular economy practices. Existing research indicates that collaboration across several stakeholders in the supply chain plays a crucial role in promoting the adoption of circular economy practices. Within the realm of Indian small and medium enterprises (SMEs), cooperation is recognized as a catalyst for the adoption of circular economy (CE) practices. This collaboration enables the efficient use of resources, cost reduction, and the achievement of sustainable results in several areas of CE implementation (Chowdhury et al., 2022). The study on Pakistani textile SMEs emphasizes the significance of circular economy entrepreneurship and consumer pressure as collaborative factors that contribute to the adoption of green technology and sustainable supply chain practices (Khan et al., 2023).

Supply side collaboration is crucial in the transition to a circular economy (Berlin et al., 2022). On the supply side, collaboration can facilitate the integration of CE principles by enabling access to shared resources, expertise, and technologies that individual SMEs may lack. For



instance, multi-stakeholder cooperation within the supply chain is identified as a driver for CE adoption, as it can lead to resource efficiency and cost savings (Elia et al., 2020).

Moreover, sustainable supply chain management practices are crucial, as they can lead to the adoption of similar practices among suppliers and sub-suppliers, creating a trickle-down effect that enhances overall sustainability (Allenbacher and Berg, 2023). Collaboration in supply chains is key to innovation for a circular economy, as it provides the combination of knowledge and capabilities necessary for product and process innovation (Berardi & de Brito, 2023). Collaboration among partners along supply chains has frequently been used as a core activity for the successful implementation of sustainability-related strategies. Engagement of external parties such as governmental, and non-governmental organizations, entrepreneurs, and research institutes complements managerial understanding on collaboration to improve the sustainability performance of CSCs (Sudusinghe & Seuring, 2022). According to Journeault et al. (2021), stakeholders play five different and complementary collaborative roles in supporting sustainability practices within SMEs: trainer, analyst, coordinator, specialist, and financial provider. These roles contribute to overcoming barriers to the integration of sustainability practices within SMEs.

On the demand side, customer pressure acts as a significant influence on SMEs' adoption of CE practices. Customers' growing awareness and demand for sustainable products can motivate SMEs to adopt CE principles to maintain their competitive advantage and meet market expectations (Khan et al., 2023; Chowdhury et al., 2022). Additionally, in the study of SMEs across multiple sectors, Howard et al. (2022) revealed that capturing value through circular practice is facilitated by emerging service markets and digital technologies, which are often driven by customer needs and preferences.

Collaboration with government and non-government organizations can also support SMEs in their transition towards CE by providing access to tools and methods that assist in CE adoption (Howard et al., 2022). Furthermore, the adoption of green technology and CE principles is positively influenced by circular economy entrepreneurship and customer pressure, which can enhance sustainable supply chain practices (Khan et al., 2023). A study done by Luthra et al. (2023) suggests that collaborative networks and partnerships can help SMEs overcome barriers and challenges associated with CE adoption, such as lack of resources, expertise, and access to

markets. Moreover, collaborative initiatives can also enhance the visibility and reputation of SMEs, as they demonstrate their commitment to sustainability and environmental responsibility.

### **1.3.1. Developing Propositions 3 and 4**

Based on the literature highlighting the pivotal role of collaboration in the adoption of CE practices, particularly within manufacturing SMEs, the following propositions are introduced to investigate the applicability of collaboration dynamics in the context of Estonian manufacturing SMEs.

*Proposition 3. Supply Side Collaboration is positively associated with the adoption of sustainability practices in Estonian manufacturing SMEs.*

*Proposition 4. Demand Side Collaboration is positively associated with the adoption of sustainability practices in Estonian manufacturing SMEs.*

The literature underscores the significance of collaboration both on the supply side and the demand side in advancing CE practices and enhancing sustainability performance (Sudusinghe & Seuring, 2022; Berlin et al., 2022). Köhler et al. (2021) and Luthra et al. (2023) emphasize the importance of cross-sectoral collaboration in fostering knowledge-sharing routines and developing ecocentric dynamic capabilities, which are essential for CE implementation. Additionally, collaboration among supply chain partners is identified as a crucial driver for CE adoption, enabling access to shared resources, expertise, and technologies that individual SMEs may lack (Elia et al., 2020). Moreover, on the demand side, customer pressure emerges as a significant influencer prompting SMEs to adopt CE principles to maintain competitiveness and meet market expectations (Khan et al., 2023; Chowdhury et al., 2022). Collaboration with customers and market partners is highlighted as essential for integrating sustainability requirements into product design, production processes, and supply chain operations (Howard et al., 2022). By framing the propositions within the context of existing literature, the aim is to provide a solid foundation for examining the relationship between collaboration and the adoption of CE practices in Estonian manufacturing SMEs.

## **1.4. Configurational Theory to Study Influencing Factors on CE Practices in SMEs**

Configurational theory, drawing on complexity theory, is used to predict and explain real-world business phenomena by considering the asymmetrical nature of the business environment (Kumar et al., 2022). It emphasizes the importance of fitting among various environmental and organizational system elements for firm success (Kreiser et al., 2019), as well as the interconnections and dependencies among different elements within an organization. Configurational research, including qualitative comparative analysis (QCA), can produce formal propositions and untangle complex interplays among factors, enhancing theory development (Ketchen Jr et al., 2021).

Configurational theory offers a valuable lens for studying Circular Economy (CE) practices in SMEs by emphasizing the unique combinations of factors that can lead to successful adoption and enhanced sustainability performance. This approach recognizes that there is no one-size-fits-all solution and that the interplay of various organizational elements can influence the effectiveness of CE practices (Chowdhury et al., 2022; Dey et al., 2022). Interestingly, while configurational theory can help identify the optimal alignment of factors such as leadership, innovation, and culture for CE adoption in SMEs, empirical evidence on this alignment is limited (Chowdhury et al., 2022).

In summary, configurational theory provides a nuanced framework for understanding how different organizational configurations can foster the adoption of CE practices in SMEs, potentially leading to improved sustainability performance. It allows for the consideration of complex interactions between various factors, which is crucial given the diversity of SMEs and their contexts. However, further empirical research is needed to validate and refine the theoretical models, especially in the context of SMEs in emerging economies (Chowdhury et al., 2022; Dey et al., 2022).

Configurational theory suggests that organizational outcomes are the result of complex interactions between various factors, rather than the influence of isolated variables. In the context of circular economy (CE) practices in small and medium-sized enterprises (SMEs), this theory can be applied to understand how different factors come together to influence the adoption and

effectiveness of CE practices. Similarly, configurational theory, specifically qualitative comparative analysis (QCA), enhances theory development in supply chain management by examining meaningful sets of observations within a sample. It allows for the exploration of causal complexity, which is particularly relevant in supply chain management where outcomes arise from an array of variables and their interplay (Ketchen Jr et al., 2021).

The studies reviewed present a complex view of the factors influencing CE practices in SMEs. For instance, Chowdhury et al. (2022) found that internal organizational factors such as leadership, innovation, culture, and skills are highlighted as significant in adopting CE practices to enhance sustainable performance. Similarly, the importance of firm positioning, personnel management, service delivery, and government policy is underscored in the context of organizational growth transition towards CE (John et al., 2023). Moreover, the role of stakeholder pressures, innovation, and collaboration capabilities in promoting CSR participation through CE practices is emphasized (Baah et al., 2023). These findings suggest that a configurational approach, considering the interplay of various factors, is indeed appropriate to studying CE practices.

### 1.5. Conceptual Model Development

Building on the past literature, the below section presents the conceptual model that explains the interconnected variables influencing the adoption of CE practices within manufacturing SMEs in Estonia. The model demonstrated in Figure 1. shows the roles of business stakeholder pressure, social stakeholder pressure, demand-side collaboration, and supply-side collaboration in shaping CE outcomes, providing a theoretical framework for empirical investigation.

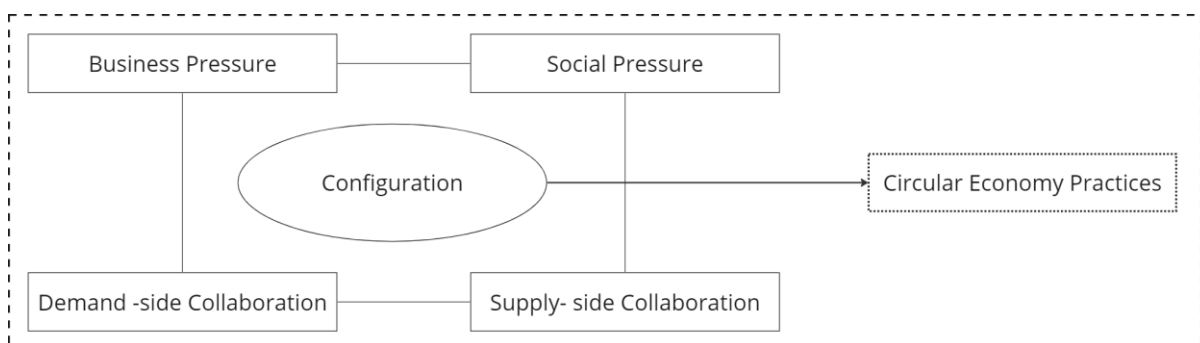


Figure 1. Conceptual Model

Source: compiled by the author based on literature discussion.

The research model proposed here aims to investigate the interplay of four interconnected variables – business stakeholder pressure, social stakeholder pressure, demand-side collaboration, and supply-side collaboration – in influencing the outcome of CE practices adoption in SMEs. This model is developed within the framework of fsQCA, which allows for a nuanced examination of the complex interactions between these variables and their impact on the adoption and effectiveness of CE practices.

Business stakeholder pressure and social stakeholder pressure are key factors in driving organizational transformation towards sustainability (Fobbe & Hilletofth, 2023). Proposition 1 suggests that business pressure positively influences the adoption of CE practices in manufacturing SMEs. This aligns with previous research indicating that pressures from consumers, suppliers, and investors can motivate firms to enhance competitiveness through sustainability practices (Mazzucchelli et al., 2022; Subarmanim & Chin, 2022). Similarly, Proposition 2 posits that social pressure positively affects the adoption of sustainability practices, reflecting the growing influence of environmental and social responsibility considerations on firms' decision-making processes (Hernandez-Arzaba et al., 2022).

Moreover, collaboration, both on the demand and supply sides, plays a pivotal role in advancing CE practices (Sudusinghe & Seuring, 2022). Supply-side collaboration facilitates the integration of CE principles by enabling access to shared resources, expertise, and technologies that individual SMEs may lack (Elia et al., 2020). Proposition 3 suggests that supply-side collaboration positively influences the adoption of sustainability practices in SMEs. This is supported by research indicating that multi-stakeholder cooperation within the supply chain drives CE adoption and leads to resource efficiency and cost savings (Allenbacher and Berg, 2023). On the demand side, customer pressure acts as a significant influencer prompting SMEs to adopt CE principles to maintain competitiveness and meet market expectations (Khan et al., 2023; Chowdhury et al., 2022). Proposition 4 proposes that demand-side collaboration positively influences the adoption of sustainability practices in SMEs. This is in line with studies highlighting the importance of collaboration with customers and market partners in integrating sustainability requirements into product design, production processes, and supply chain operations (Howard et al., 2022).

By employing fsQCA, this research model seeks to unravel the complex interactions among these variables and their configurations that lead to the outcome of CE practices in SMEs. Configurational theory emphasizes the importance of fit among various environmental and organizational system elements for firm success, acknowledging the unique combinations of factors that can influence the effectiveness of CE practices (Kumar et al., 2023). The proposed model draws upon existing literature to develop propositions that guide empirical investigation into the role of stakeholder pressure and collaboration dynamics in shaping CE adoption among SMEs, providing a solid foundation for further research in this area.

## 2. METHODOLOGY

The objective of this section is to provide insight into the research design and methodology utilized, including the process of data collection and the preparation of the data for analysis. The research process, which is detailed in Fig. 2., shows that the flow chart begins with defining the problem, aim, and objectives, followed by a comprehensive review of existing literature. This sets the stage for formulating research questions and developing a conceptual model. Identifying the appropriate methodology is crucial before proceeding to data collection, where information is gathered. Subsequently, careful data analysis is conducted to derive meaningful insights, leading to a discussion of findings. From there, the thesis can offer recommendations, both practical and theoretical, along with implications and conclusions, encapsulating the study's contributions and significance.

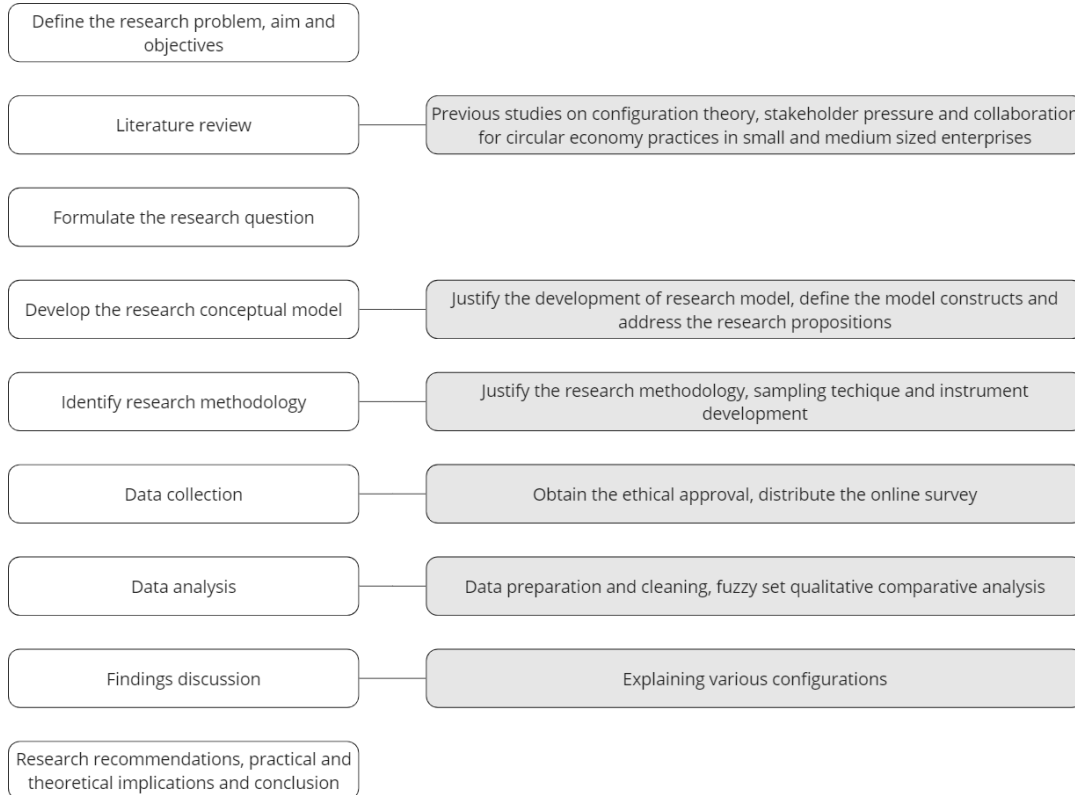


Figure 2. Flow chart of research process.

Source: developed by the author.

A predominantly qualitative approach was chosen to address the research question and propositions. Qualitative research focuses on analyzing situations, phenomena, social actions, or interactions without rigid mathematical or ordinal categorizations (Taylor and Trujillo, 2001).

## **2.1. Qualitative Comparative Analysis**

This thesis employs Qualitative Comparative Analysis (QCA) to investigate the relationship between stakeholder pressure, collaboration, and CE practices within Estonian manufacturing SMEs. The choice of QCA is grounded in theoretical expectations, as it is anticipated that stakeholder pressure and collaboration together produce CE practices, rather than acting independently. Unlike conventional quantitative and qualitative methods that focus on assessing the effect of a single variable on a dependent variable, QCA allows for the identification of conditions or sets of conditions that are either necessary or sufficient for an outcome (Schneider and Wagemann, 2012).

QCA operates based on three main assumptions: multiple conjunctural causation, equifinality, and asymmetric causation. Multiple conjunctural causation is particularly relevant to this study, as it acknowledges that the effect of one condition depends on the presence or absence of other conditions. This aligns with the complexity inherent in sustainability practices, where various factors interact to influence outcomes. Equifinality recognizes that different combinations of conditions can lead to the same outcome, reflecting the diverse pathways to achieving CE practices. Asymmetric causation acknowledges that the presence of one condition may lead to an outcome, but the absence of that condition does not necessarily preclude the outcome from occurring (Berg-Schlosser & De Meur, 2009).

The main advantage of QCA, particularly fuzzy-set QCA (fsQCA), lies in its ability to accommodate qualitative nuances and empirical differences in data. Unlike crisp-set QCA, which operates on binary or categorical values, fsQCA allows for the inclusion of varying degrees of membership in conditions. The fsQCA has gained increased attention in the research as it transforms quantitative data into fuzzy sets, allowing for a more nuanced analysis that captures the degree of membership of cases in specific sets, bridging the gap between qualitative and quantitative methods (Ragin, 2009). By calibrating measures and transforming data into a [0, 1] range, fsQCA enables researchers to interpret relevant and irrelevant variations qualitatively,



allowing the use of surveys that collect quantitative data and turning it into qualitative data later, while also allowing for precise placement of cases relative to each other. The method allows researchers to compute multiple solutions for various types of users, accommodating diverse requirements and explaining outcomes based on different combinations of conditions, which is particularly useful in Information Systems and marketing studies (Pappas and Woodside, 2021).

Overall, QCA, and specifically fsQCA, offers a methodological framework that aligns with the complexity and multifaceted nature of sustainability practices within Estonian manufacturing SMEs. By systematically examining the interplay between stakeholder pressure, collaboration, and CE practices, this approach aims to uncover the conditions or combinations of conditions that contribute to sustainable outcomes in this context.

### **2.1.1. Interpretation of Results**

Before continuing to describe the research design, it is crucial to provide a brief explanation of how one interprets the results of a Qualitative Comparative Analysis (QCA). The analysis yields a so-called "Solution Table," in which one or multiple "pathways" are presented. Each pathway represents a combination of conditions that are sufficient to produce the outcome. For example, if a pathway contains conditions "XYZ," it indicates that the simultaneous presence of X, Y, and Z is sufficient to generate the outcome (Schneider & Wagemann, 2012; Ragin, 2018).

Additionally, the Solution Table includes information on each pathway's "coverage" and "consistency" scores. The coverage score signifies the percentage of cases covered by the pathway, providing insights into the pathway's effectiveness in accounting for observed cases (Schneider & Wagemann, 2012; Ragin, 2018). Moreover, the unique coverage score highlights the number of cases exclusively covered by a specific pathway, considering the possibility of cases having partial membership in multiple pathways (Ragin, 2018).

In contrast, the consistency score serves as a measure of the strength of each pathway. While ideally approaching 1.0, a consistency score should never fall below 0.75 to be considered "significant." This score reflects the degree to which membership in the pathway aligns with membership in the outcome, indicating the proportion of cases covered by the pathway that correspond to the outcome (Schneider & Wagemann, 2012; Ragin, 2009, 2018).

Furthermore, the Solution Table provides a "solution formula," consolidating all pathways into a concise expression. This formula offers a comprehensive overview of the various pathways identified in the analysis, facilitating a deeper understanding of the interrelationships between conditions and the outcome (Ragin, 2018).

## 2.2. Variables

This section provides concise definitions for the key variables within the conceptual model, elucidating their significance in shaping the adoption of CE practices in manufacturing SMEs (Tab. 1).

Table 1. Items for each variable.

Variable	Items	Source
Circular economy practices	Use of renewable raw materials in products	(Ali & Johl, 2023; Bag et al., 2021; Chowdhury et al., 2022; Dey et al., 2020, 2022; Saha et al., 2021; Zeng et al., 2017)
	Reuse of post-consumer products/parts in production	
	Reuse of leftover material for new products	
	Reuse of product packaging materials	
	Use of least energy/resources in the production stage	
	Consideration of recyclability in product design	
Business pressure	Impact of Customers on firm's sustainability efforts	(Adomako & Tran, 2022; Bhatia & Kumar, 2022; Huang et al., 2023; Tian et al., 2023)
	Impact of Suppliers on firm's sustainability effort	
	Impact of Shareholders on firm's sustainability efforts	
	Impact of Employees on firm's sustainability efforts	
	Impact of Competitors on firm's sustainability efforts	
Social pressure	Impact of Government and regulatory bodies on firm's sustainability efforts	(Adomako & Tran, 2022; Bhatia & Kumar, 2022; Chu et al.,
	Impact of NGOs on firm's sustainability efforts	
	Impact of Communities and social groups on firm's sustainability	

	efforts	2018; Hofman et al., 2020; Wang et al., 2018; Zeng et al., 2017)
	Impact of Media on firm's sustainability efforts	
Supply side collaboration	Degree of cooperation with suppliers to achieve sustainability goals	(Adomako & Tran, 2022; Barón Dorado et al., 2022; Chang, 2019; Huang et al., 2023; Ranjan & Read, 2016; Tian et al., 2023; Yousaf, 2021)
	Degree of cooperation with suppliers for the ecological design of products	
	Degree of conducting joint planning to anticipate and resolve sustainability issues with suppliers	
	Degree of developing a mutual understanding of responsibilities with suppliers regarding sustainability performance	
	Degree of collaboration with suppliers in sustainable product development	
Demand side collaboration	Degree of cooperation with consumers to achieve sustainability goals	(Adomako & Tran, 2022; Barón Dorado et al., 2022; Chang, 2019; Huang et al., 2023; Ranjan & Read, 2016; Tian et al., 2023; Yousaf, 2021)
	Degree of cooperation with consumers for the ecological design of products	
	Degree of conducting joint planning to anticipate and resolve sustainability issues with consumers	
	Degree of developing a mutual understanding of responsibilities with consumers regarding sustainability performance	
	Degree of collaboration with consumers in sustainable product development	

Source: compiled by the author.

Circular economy practices: The six items provided offer a holistic perspective on the spectrum of activities encompassing CE practices within manufacturing SMEs. From the utilization of renewable raw materials in products to the consideration of recyclability during the product design stage, these items reflect a commitment to sustainability across the entire product

lifecycle. Initiatives such as the reuse of post-consumer products, leftover materials, and product packaging underscore a strategic approach to resource optimization and waste minimization. Furthermore, the emphasis on minimizing energy and resource consumption during production highlights the importance of efficiency and environmental responsibility in manufacturing processes (Ali & Johl, 2023; Bag et al., 2021; Chowdhury et al., 2022; Dey et al., 2020, 2022; Saha et al., 2021; Zeng et al., 2017).

**Business pressure:** The evaluation of business stakeholder pressure encompasses various stakeholders who wield influence over a firm's sustainability endeavours. It consists of five items. Among these stakeholders, customers, suppliers, shareholders, employees, and competitors play pivotal roles in shaping and driving sustainability efforts within the organization. Customers, as key drivers of market demand, exert significant influence through their preferences, expectations, and purchasing decisions. Similarly, suppliers, as strategic partners in the supply chain, can impact sustainability initiatives through their practices, product offerings, and commitment to environmental standards. Shareholders, as investors and owners, may influence sustainability efforts through their financial support, expectations for corporate responsibility, and advocacy for sustainable practices. Employees, as internal stakeholders, contribute to sustainability efforts through their engagement, behaviour, and adherence to environmental policies and practices. Additionally, competitors, as industry peers, exert pressure through their actions, innovations, and market positioning, influencing the firm's approach to sustainability to maintain competitiveness (Adomako & Tran, 2022; Bhatia & Kumar, 2022; Chu et al., 2018; Hofman et al., 2020; Huang et al., 2023; Tian et al., 2023; Wang et al., 2018; Zeng et al., 2017).

**Social pressure:** Social pressure, with four items, encompasses a broad spectrum of stakeholders who exert influence over a firm's sustainability efforts, each with unique roles and contributions. Government and regulatory bodies play a significant role in shaping sustainability practices through legislation, policies, and enforcement mechanisms aimed at promoting environmental protection and social responsibility. NGOs serve as advocates for environmental and social causes, leveraging their expertise, networks, and activism to influence corporate behaviour and advocate for sustainable practices. Communities and social groups represent local stakeholders whose concerns, values, and expectations can impact a firm's social license to operate, reputation, and relationships with key stakeholders. Media, as a powerful communication channel, has the ability to shape public perception, raise awareness, and hold companies

accountable for their environmental and social performance through investigative reporting, public discourse, and advocacy campaigns (Adomako & Tran, 2022; Bhatia & Kumar, 2022; Chu et al., 2018; Hofman et al., 2020; Huang et al., 2023; Tian et al., 2023; Wang et al., 2018; Zeng et al., 2017).

**Supply side collaboration:** Supply side collaboration, with five items, involves cooperation with various actors in the supply chain to advance sustainability goals and practices. This collaboration encompasses activities such as working with suppliers to achieve sustainability objectives, including ecological design of products and joint planning to address sustainability issues. Additionally, it involves developing a mutual understanding of responsibilities regarding sustainability performance and collaborating on sustainable product development initiatives (Adomako & Tran, 2022; Barón Dorado et al., 2022; Chang, 2019; Huang et al., 2023; Ranjan & Read, 2016; Tian et al., 2023; Yousaf, 2021).

**Demand side collaboration:** Demand side collaboration, with five items, involves engaging with consumers to achieve sustainability goals and practices. This collaboration includes activities such as working with consumers to design ecologically sustainable products, conducting joint planning to address sustainability issues, and developing a mutual understanding of responsibilities regarding sustainability performance. Additionally, it encompasses collaborating with consumers on sustainable product development initiatives (Adomako & Tran, 2022; Barón Dorado et al., 2022; Chang, 2019; Huang et al., 2023; Ranjan & Read, 2016; Tian et al., 2023; Yousaf, 2021).

A 5-point Likert Scale was employed for this research (Joshi et al., 2015). Respondents were presented with a series of statements and were asked to indicate their level of agreement or disagreement with each statement with 1 being “Strongly disagree” and 5 being “Strongly Agree”. The primary purpose of using a Likert scale in this research was to assess the attitudes, opinions, perceptions of individuals towards CE practices and different variables that affect them. The Likert Scale is extremely useful in identifying trends and patterns.

### 2.3. Research Setting and Sample

The choice to focus on Estonian manufacturing SMEs is deliberate, driven by several factors. Firstly, Estonia presents an intriguing context characterized by its unique socio-economic landscape, where SMEs play a pivotal role in driving economic growth and innovation. As a member of the European Union with an expanding entrepreneurial ecosystem, Estonia offers a compelling case study for exploring sustainability practices in a dynamic and rapidly evolving business environment (The World Bank, 2023). Secondly, the manufacturing sector in Estonia represents a vital component of the national economy, contributing significantly to employment, export revenues, and industrial innovation. By targeting this specific sector, the study aims to shed light on the CE challenges and opportunities facing SMEs operating in a competitive and globally interconnected market (Islam et al., 2022; Jamwal et al., 2023). Thirdly, the Estonian government has shown a growing commitment to promoting sustainable development and green innovation, evidenced by its initiatives to support SMEs in adopting environmentally friendly practices and technologies (Ahmadov et al., 2022; Gerstlberger et al., 2023). This supportive policy environment underscores the timeliness and relevance of investigating sustainability dynamics within Estonian manufacturing SMEs, offering valuable insights for policymakers, industry stakeholders, and academic researchers alike.

This study focuses on exploring the synergistic effects of stakeholder pressure, collaboration, and CE performance within the specific context of SMEs, particularly in the manufacturing sector in Estonia. By employing Fuzzy-set Qualitative Comparative Analysis (fsQCA) and drawing upon Configurational Theory, the study aims to delve into the intricate interplays and causal relationships between these factors. Through empirical investigation and data analysis, the author seeks to uncover the configurations of factors that lead to enhanced CE outcomes in Estonian manufacturing SMEs.

To fulfill the research aim, a survey was compiled. For the data collection, the author and another MA student, Elchin Nabiyeu, collaborated due to shared topic interests and resource limitations with Qualtrics. To avoid survey fatigue and maximize quality, validated survey items from top journals were used. Each of the authors contributed survey items, which were merged into one comprehensive survey, minimizing redundancy and optimizing resource use. This collaborative approach exemplifies efficient academic research teamwork and has been informed to the program head in advance. Considering the multilingual composition of the Estonian population,

characterized mainly by three languages – Estonian, Russian, and English, the questionnaire was translated into said languages, to provide options, ensure comfort and increase the response rate. The survey was distributed to 318 small and medium-sized manufacturing enterprises (SMEs) listed in the Orbis Europe database (Orbis, 2023). It was sent out on November 14th, 2023, followed up by two reminders on December 1st and 11th and later closed after the holidays in January. Following the "complete case analysis" method to handle missing data (Hughes et al., 2019), 78 responses were deemed suitable for the fsQCA analysis. The questionnaire consisted of 6 sets of statements focusing on different aspects of research as well as a section with questions collecting general information about the surveyed companies. The sets of statements included statements regarding current CE practices that the companies are making use of, sustainability initiatives they are planning to implement, the collaborations and cooperations that are happening in regard to CE practices. The ratings the respondents could give to the statement were 1 through 5, where 1 meant either “absolutely disagree” or the lowest rating, and 5 meant “absolutely agree” or the highest rating.

As seen in Tab. 2, the respondents' profile encompasses a broad spectrum of characteristics, providing valuable insights into the demographics and professional backgrounds of those participating in the study. In terms of gender distribution, the majority of respondents identify as male, comprising 63% of the sample, while 33% are female, and 4% preferred not to disclose their gender. This gender diversity reflects a varied representation within the surveyed population, contributing to a comprehensive understanding of perspectives and experiences within the context of sustainability practices in Estonian manufacturing SMEs.

Further analysis of the respondents' profiles reveals notable trends in firm size, with a significant proportion belonging to small enterprises, constituting 51% of the sample. Micro-enterprises follow closely behind, representing 26% of respondents, while medium-sized firms account for 24%. This distribution highlights the participation of SMEs across different scales of operation, reflecting the inclusive nature of the study and its relevance to businesses of varying sizes within the Estonian manufacturing landscape.

Education level emerges as another key aspect of the respondents' profile, showcasing a diverse range of educational backgrounds among participants. While 45% of respondents hold a master's degree, indicating a high level of educational attainment within the sample, 31% possess a diploma/certificate, reflecting a mix of formal education and vocational training. Additionally,

22% have completed undergraduate studies, and 3% hold a doctorate, underscoring the breadth of academic qualifications represented among the surveyed population.

Examining the distribution of respondents by business type provides insights into the nature of their operations and target markets. Business-to-Business (B2B) transactions emerge as the dominant mode of operation, with 37% of respondents engaged in this type of commerce. Business-to-Consumer (B2C) transactions account for 12% of the sample, reflecting a smaller but still significant proportion, while 51% of respondents operate in both B2B and B2C spheres, indicating a diversified approach to market engagement.

The analysis of respondents' positions within their respective organizations offers valuable insights into the roles and responsibilities driving sustainability initiatives within Estonian manufacturing SMEs. Owners constitute the largest group, comprising 45% of respondents, indicating a significant leadership presence among those shaping organizational strategies and priorities. Production managers and marketing managers represent 13% and 3% of respondents, respectively, highlighting the involvement of key operational and strategic stakeholders in sustainability-related decision-making processes.

Environmental certifications play a crucial role in signaling organizational commitment to sustainability and adherence to established standards and frameworks. Analysis of respondents' certification status reveals that 27% adhere to the ISO 14000 family, indicating a proactive approach to environmental management and compliance. Additionally, 5% have obtained EMAS certification, further underscoring their commitment to rigorous environmental performance standards. However, a significant portion of respondents (60%) do not possess any environmental certification, suggesting potential opportunities for capacity-building and awareness-raising initiatives within the sector.

Finally, the internationalization status of respondents' businesses sheds light on their global orientation and engagement with international markets. A substantial majority of respondents (73%) have internationalized their businesses, indicating a proactive approach to expanding market reach and accessing new opportunities beyond domestic borders. Conversely, 27% of respondents have not internationalized their businesses, highlighting potential variations in strategic priorities and market strategies within the Estonian manufacturing SME sector.



Table 2. Sample profile

	count	%		count	%
<b>Respondents profile</b>			<b>Firm size</b>		
Female	26	33	Micro	20	26
Male	49	63	Small	40	51
Prefer not to say	3	4	Medium	18	24
<b>Education level</b>			<b>Business type</b>		
Diploma/certificate	24	31	B2B	29	37
Undergraduate	17	22	B2C	9	12
Master's degree	35	45	Both	40	51
Doctorate	2	3	<b>Environmental certificates</b>		
<b>Position</b>			ISO 14000 family	21	27
Owner	35	45	EMAS	4	5
Production manager	10	13	Don't have	47	60
Marketing manager	2	3	Other	10	13
Supply chain manager	2	3	<b>Internationalisation</b>		
Quality manager	4	5	Internationalised	57	73
Other	25	32	Non-internationalised	21	27

Source: Research results, compiled by the author in collaboration with another researcher.

Table 3 showcases the distribution of surveyed companies across various manufacturing sectors

Table 3. Field of activity

	Count	Percentage
Other	28	36%
Manufacture of wood and of products of wood and cork	14	18%
Manufacture of fabricated metal products, except machinery and equipment	9	12%
Printing and reproduction of recorded media	4	5%
Manufacture of furniture	4	5%
Manufacture of textiles	3	4%
Manufacture of chemicals and chemical products	3	4%

Manufacture of wearing apparel	2	3%
Manufacture of paper and paper products	2	3%
Manufacture of rubber and plastic products	2	3%
Manufacture of electrical equipment	2	3%
Manufacture of food products	1	1%
Manufacture of leather and related products	1	1%
Manufacture of basic metals	1	1%
Manufacture of machinery and equipment	1	1%
Manufacture of other transport equipment	1	1%

Source: Research results, compiled by the author in collaboration with another researcher.

The following results were obtained: the "Other" category comprising the largest proportion at 36%. Following closely behind is the "Manufacture of wood and of products of wood and cork" category, representing 18% of the sample. Additionally, sectors such as "Manufacture of fabricated metal products" and "Printing and reproduction of recorded media" each constitute 12% and 5% of the sample, respectively. Notably, industries like "Manufacture of furniture," "Manufacture of textiles," and "Manufacture of chemicals and chemical products" each contribute between 3% to 5% to the overall sample, showcasing a varied representation within the Estonian manufacturing landscape.

## 2.4. Ethical Considerations

The research topic and research design both raise ethical considerations that need to be addressed throughout the thesis writing. In the context of conducting a survey-based study on CE practices in SMEs, several ethical principles must be upheld to maintain the integrity and trustworthiness of the research process.

- First and foremost, informed consent is essential. Participants must be fully informed about the nature of the study, its objectives, potential risks and benefits, and their rights as participants. In this study, participants were informed about the purpose of the research, the voluntary nature of participation, and the anonymity and confidentiality of their responses. Additionally, participants were given the option to provide their email addresses if they wished to receive the study results, ensuring transparency and respect for their autonomy.

- Privacy and confidentiality are also critical ethical considerations. Participants must feel confident that their responses will be kept confidential and anonymized to protect their identity. In this survey, measures were implemented to ensure the anonymity of participants, such as removing any identifying information from the data collected and storing it securely. Moreover, the dissemination of findings will be done in aggregate form, further safeguarding the anonymity of participants.
- Furthermore, transparency and honesty in research practices are imperative. Participants should be provided with accurate and truthful information about the study's purpose, procedures, and potential implications. In this study, it is being made transparent about the intentions to disseminate the findings in public for the benefit of the participants and the broader community interested in CE practices. By openly sharing the results, the principles of transparency and accountability, allowing participants to access and utilize the findings for their own purposes.
- Lastly, ethical research conduct involves respecting the rights and dignity of participants. This includes ensuring voluntary participation, minimizing any potential harm or discomfort, and treating participants with respect and sensitivity. Throughout the survey process, efforts were made to minimize any potential risks or discomfort to participants, while also respecting their time and contributions to the research.

### **3. DATA ANALYSIS**

In conducting the fsQCA, three distinct steps are followed to produce results: testing for necessary conditions for the outcome, testing for sufficient sets of conditions for the outcome, and testing for the absence of the outcome. Unlike traditional quantitative methods, fsQCA does not assume causal symmetry, so analyzing both the presence and absence of conditions is crucial for understanding the complexity of causal relationships.

In the first step, the analysis focuses on identifying necessary conditions for the outcome of interest. Necessary conditions are those factors that must be present for the outcome to occur. This step involves examining each variable to determine its importance in contributing to the outcome (Ragin & Davey, 2022). The coverage and consistency scores are calculated to assess the extent to which the identified conditions explain the outcome (Ketchen Jr et al., 2021).

The second step involves testing for sufficient sets of conditions for the outcome. Sufficient sets are combinations of conditions that, when present together, are sufficient to produce the outcome. This step entails exploring various combinations of conditions to identify which combinations are associated with the outcome (Ketchen Jr et al, 2021). Again, coverage and consistency scores are calculated to evaluate the explanatory power of the identified sufficient sets (Ragin & Davey, 2022).

Lastly, the third step involves testing for the absence of the outcome. This step is essential for understanding the conditions that are necessary for the absence of the outcome. Similar to the first two steps, coverage and consistency scores are calculated to assess the explanatory power of the identified conditions for the absence of the outcome (Ketchen Jr et al, 2021).

To conduct the fsQCA analysis, Ragin's and Davey's software is utilized. This software, developed specifically for fsQCA, is widely used for its user-friendly interface and transparent decision-making process (Ragin & Davey, 2022). It facilitates the exploration of various

combinations of conditions and provides accurate coverage and consistency scores, aiding researchers in making informed interpretations of the results.

### 3.1. Cronbach's Alpha Analysis

Cronbach's alpha (Tab. 4) is a measure of the internal consistency or reliability of a scale or questionnaire (Vaske et al., 2017). It assesses the extent to which items within a scale are correlated and measures the same underlying construct. In this study, Cronbach's alpha was calculated for each variable included in the analysis.

Table 4. Correlation analysis

	1	2	3	4	5
1. CEP					
2. BP	0.1961				
3. SP	0.1401	0.4484			
4. SCOL	0.6747	0.4275	0.2218		
5. DCOL	0.5584	0.2749	0.2309	0.6848	
Cronbach alpha	0.7503	0.7475	0.7148	0.9105	0.8925
Mean	2.908	3.259	2.564	2.441	2.374
S.D.	0.107	0.097	0.106	0.121	0.116

Source: analysed results, compiled by the author.

The calculated Cronbach's alpha values for each variable are as follows:

- Business Pressure (BP): 0.7503
- Social Pressure (SP): 0.7475
- Supply-Side Collaboration (SCOL): 0.7148
- Demand-Side Collaboration (DCOL): 0.9105

These values indicate a high level of internal consistency among the items within each variable. Generally, Cronbach's alpha values above 0.7 are considered acceptable for research purposes, indicating that the items within each variable reliably measure the intended construct (Taber, 2018). Therefore, the questionnaire used in this study demonstrates good reliability in capturing

stakeholder pressure, collaboration, and sustainability practices among Estonian manufacturing SMEs.

## 4. RESULTS AND DISCUSSION

In this section, the analysis of CE practices adoption among manufacturing SMEs in Estonia reveals three distinct pathways that illuminate the multifaceted nature of factors influencing sustainability initiatives within this context. Through a QCA, each pathway is examined in detail, drawing upon existing literature to contextualize the findings and offer critical insights into the implications for CE adoption.

### 4.1. fsQCA Configurations

The analysis of CE practices in manufacturing SMEs in Estonia has yielded three distinct pathways that shed light on the multifaceted nature of factors influencing the adoption of CE practices within this context (Tab. 5). Each pathway presents a unique combination of conditions that are deemed sufficient to drive the implementation of CE practices. The below section provides detailed insight into each pathway, discussing its implications in light of existing literature and providing a critical analysis of the findings.

Table 5. Analysis of sufficient conditions for achieving CE practices.

	BP	SP	SCOL	DCOL	Raw Coverage	Unique Coverage	Consistency	Solution coverage	Solution consistency
Path 1				●	0.723	0.101	0.832	0.851	0.786
Path 2	○	●			0.467	0.045	0.815		
Path 3	●		●		0.657	0.061	0.900		

Note: Black dots indicate the presence of causal conditions and white dots indicate the absence or negation of causal conditions. Large dots; core conditions, Small dots; peripheral conditions, Blank space; “don’t care” conditions

Source: analysis results, compiled by the author.

#### **4.1.1. Path 1: Only Demand Side Collaboration (DCOL)**

The first pathway identified in the analysis underscores the significance of demand side collaboration in fostering CE practices within manufacturing SMEs in Estonia. This pathway suggests that peripheral conditions related to collaboration with stakeholders on the demand side are crucial for driving the adoption of CE practices. This finding aligns with prior research highlighting the importance of stakeholder engagement and collaboration in promoting sustainable business practices (Bocken et al., 2016; Tukker et al., 2015).

Literature suggests that collaboration with stakeholders, particularly on the demand side, can facilitate the exchange of knowledge, resources, and expertise, thereby enabling SMEs to identify and implement CE initiatives effectively (Leal Filho et al., 2018). By engaging with customers, suppliers, and other relevant stakeholders, SMEs can gain insights into market demands, consumer preferences, and emerging trends, which can inform the development of innovative and sustainable products and services (Fang et al., 2017).

With a raw coverage of 72.3% and a consistency score of 83.2%, this configuration demonstrates a solid association between demand side collaboration and the adoption of circular economy practices. Specifically, it suggests that SMEs actively engaging with customers and market partners to integrate sustainability requirements into their operations, products, and supply chains are more likely to adopt CE practices.

However, while demand side collaboration holds promise for driving CE practices, SMEs may face challenges in establishing and maintaining effective partnerships with stakeholders. Issues such as limited resources, lack of awareness, and divergent interests among stakeholders may hinder collaboration efforts (Mont et al., 2017; Lozano et al., 2016). Therefore, policymakers and industry stakeholders must work collaboratively to create an enabling environment that incentivizes and supports SMEs in engaging with stakeholders on the demand side to promote sustainable business practices.

This finding strongly supports Proposition 4, which posits that collaborative efforts with customers and market partners drive the adoption of sustainability practices in SMEs. By aligning with market demands and consumer preferences, SMEs can enhance their



competitiveness, improve their brand reputation, and meet evolving expectations for environmental responsibility.

Furthermore, this configuration underscores the importance of understanding and responding to customer needs and preferences in driving sustainability initiatives. By fostering dialogue, co-creating solutions, and promoting responsible consumption patterns, SMEs can establish themselves as leaders in sustainability and gain a competitive edge in the market.

Overall, Path 1 highlights the critical role of demand side collaboration in driving the adoption of sustainability practices among Estonian manufacturing SMEs. It emphasizes the need for SMEs to actively engage with customers and market partners to integrate sustainability considerations into their business strategies, thereby contributing to a more sustainable and environmentally responsible economy.

#### **4.1.2. Path 2: Social Pressure (SP) Without Business Pressure (BP)**

The second pathway highlights the importance of social pressure and the absence of business pressure in fostering the adoption of CE practices within manufacturing SMEs in Estonia. This pathway suggests that when SMEs face social pressure to adopt CE practices and experience a lack of business pressure, they are more likely to embrace sustainability initiatives.

Despite a lower raw coverage of 46.7%, the configuration demonstrates a high consistency score of 81.5%, indicating the strength of the relationship between social pressure and sustainability practices. This suggests that SMEs are responsive to societal demands for environmental responsibility and are motivated to adopt sustainability practices to meet these expectations.

Previous research has emphasized the role of social pressure, including public awareness campaigns, consumer activism, and regulatory mandates, in driving businesses to adopt environmentally sustainable practices (Delmas & Burbano, 2011; Ahammad et al., 2020). Social pressure can influence SMEs' perceptions of societal expectations and norms, prompting them to align their operations with sustainability objectives to enhance their reputation and legitimacy (Banerjee, 2001; Marques & Ferreira, 2020).

The absence of direct business pressure in this configuration suggests that SMEs may be driven more by ethical considerations and a desire to align with societal values rather than by immediate economic imperatives. According to previous research by Porter & Kramer (2011), Kolk & van Tulder (2010) the absence of business pressure suggests that SMEs may be less influenced by competitive dynamics and market forces, allowing them to prioritize social and environmental considerations in their decision-making processes. This finding underscores the importance of regulatory frameworks, industry standards, and societal norms in shaping SMEs' behaviour and fostering a conducive environment for sustainable business practices.

However, it is essential to recognize that social pressure alone may not be sufficient to drive the widespread adoption of CE practices among SMEs. While public awareness and consumer preferences can influence SMEs' behaviour, factors such as economic viability, resource availability, and managerial capabilities also play critical roles in determining the feasibility and effectiveness of sustainability initiatives (Schaltegger et al., 2018; Lüdeke-Freund & Dembek, 2017).

This finding strongly aligns with Proposition 2, which suggests that socially conscious stakeholders, including consumers and communities, play a crucial role in driving sustainability initiatives among SMEs. By exerting pressure on SMEs to adopt sustainable practices, society influences their decisions towards environmental and social responsibility.

The absence of direct business pressure in this configuration suggests that SMEs may be driven more by ethical considerations and a desire to align with societal values rather than by immediate economic imperatives. This highlights the importance of corporate social responsibility (CSR) and the growing emphasis on ethical business practices in today's business landscape.

Furthermore, this configuration underscores the need for SMEs to build trust and credibility with their stakeholders by demonstrating a commitment to sustainability and environmental responsibility. By aligning their operations with societal expectations and engaging in transparent and responsible business practices, SMEs can enhance their reputation and gain a competitive advantage in the market.

Overall, Path 2 emphasizes the significant influence of social pressure on the adoption of sustainability practices among Estonian manufacturing SMEs. It highlights the importance of

addressing societal expectations and norms in driving sustainability initiatives and underscores the role of SMEs as responsible corporate citizens in contributing to a more sustainable and environmentally conscious society.

#### **4.1.3. Path 3: Business Pressure (BP) and Supply-Side Collaboration (SCOL)**

The third pathway highlights the importance of business pressure and supply side collaboration in driving the adoption of CE practices within manufacturing SMEs in Estonia. This pathway suggests that peripheral conditions related to business pressure and collaboration with stakeholders on the supply side are instrumental in promoting sustainability initiatives.

With a raw coverage of 65.7% and a consistency score of 90.0%, this configuration demonstrates a significant relationship between business pressure, supply side collaboration, and the adoption of sustainability practices. It suggests that SMEs facing significant business pressures, such as market competition and regulatory requirements, are more likely to adopt sustainability practices to enhance their competitiveness and meet market demands.

Previous studies have emphasized the role of competitive pressure and market dynamics in driving businesses to adopt sustainable practices (Bansal & Roth, 2000; Sharma & Henriques, 2005). SMEs may face pressure from customers, competitors, and industry peers to demonstrate their commitment to environmental stewardship and corporate social responsibility (Carter & Rogers, 2008; Lozano & Huisinigh, 2011). This pressure can incentivize SMEs to integrate sustainability considerations into their operations and supply chain management practices to remain competitive and enhance their market position (Dangelico & Pujari, 2010; Zhu et al., 2018).

Moreover, collaboration with stakeholders on the supply side, including suppliers, distributors, and logistics partners, can facilitate the implementation of CE practices by enabling SMEs to optimize resource utilization, reduce waste, and enhance efficiency across the value chain (Seuring & Müller, 2008; Walker et al., 2014). By fostering closer partnerships and collaboration with supply chain partners, SMEs can leverage shared resources and expertise to identify innovative solutions and implement sustainable practices effectively (Beske et al., 2014; Pagell & Wu, 2009).

However, SMEs may encounter challenges in fostering collaboration with supply chain partners, such as issues related to trust, information sharing, and coordination (Carter & Jennings, 2002; Choi & Wu, 2009). Therefore, policymakers and industry stakeholders must work collaboratively to create an enabling environment that encourages SMEs to collaborate with supply chain partners and implement CE practices effectively.

This finding aligns closely with Propositions 1 and 3, which suggest that manufacturing SMEs facing business pressure are more inclined to adopt sustainability practices and that collaboration with suppliers fosters knowledge exchange and innovation, facilitating the adoption of sustainability practices. By collaborating with suppliers on sustainability initiatives, SMEs can access shared resources, expertise, and technologies that contribute to the adoption and implementation of sustainability practices.

The strong association between business pressure, supply side collaboration, and the adoption of sustainability practices underscores the interconnectedness of external pressures and collaborative efforts in driving sustainability initiatives within SMEs. By responding to market demands and regulatory requirements while leveraging collaborative partnerships with suppliers, SMEs can enhance their sustainability performance and gain a competitive advantage in the market.

Overall, Path 3 highlights the importance of external pressures and collaborative efforts in driving the adoption of sustainability practices among Estonian manufacturing SMEs. It underscores the need for SMEs to align their business strategies with market demands, regulatory requirements, and collaborative partnerships to foster a more sustainable and environmentally responsible business environment.

## **4.2. Conceptual Model**

The findings of the study offer critical insights into the dynamics of CE practices adoption within manufacturing SMEs in Estonia, particularly in relation to the proposed conceptual model. The research model, depicted in Figure 1, delineates the interconnected variables influencing the adoption of CE practices, emphasizing the roles of business stakeholder pressure, social stakeholder pressure, demand-side collaboration, and supply-side collaboration. By examining

the identified pathways in light of this model, the validity and applicability of the proposed relationships can be critically assessed.

Firstly, Proposition 1 posits that business stakeholder pressure positively influences the adoption of CE practices in SMEs. However, the findings reveal that while business pressure plays a role in driving CE adoption, its influence may not always be direct or predominant. Pathways 1 and 3 suggest that peripheral conditions related to demand side collaboration and supply side collaboration, respectively, are crucial for CE adoption, indicating that collaboration with stakeholders may act as mediators or moderators of the relationship between business pressure and CE practices adoption. This finding underscores the complexity of stakeholder dynamics and highlights the need for a nuanced understanding of how different types of pressure interact with collaboration efforts to shape sustainability outcomes.

Similarly, Proposition 2 asserts that social stakeholder pressure positively affects the adoption of sustainability practices in SMEs. While Pathway 2 supports this proposition by highlighting the importance of social pressure in driving CE adoption, it also underscores the role of the absence of business pressure as a contributing factor. This suggests that the relationship between social pressure and CE adoption may be contingent upon the absence of competing business pressures, highlighting the need for further exploration of the interplay between different forms of pressure and their implications for sustainability practices adoption.

Furthermore, Proposition 3 posits that supply-side collaboration positively influences the adoption of CE practices in SMEs. Pathway 3 provides empirical support for this proposition, indicating that peripheral conditions related to supply side collaboration are instrumental in fostering CE adoption. However, it is essential to recognize that collaboration alone may not suffice in driving sustainability practices adoption, as evidenced by the absence of supply side collaboration in Pathway 1. This highlights the need for a holistic approach that considers the interplay of various factors, including stakeholder pressures, collaboration dynamics, and contextual factors, in shaping CE adoption outcomes.

Finally, Proposition 4 suggests that demand-side collaboration positively influences the adoption of sustainability practices in SMEs. While Pathway 1 provides partial support for this proposition by highlighting the importance of demand side collaboration, it also underscores the role of peripheral conditions related to collaboration efforts on the demand side. This suggests

that the effectiveness of demand-side collaboration may depend on specific contextual factors and collaboration dynamics, underscoring the need for a nuanced understanding of how different collaboration approaches influence CE adoption outcomes.

In conclusion, the findings of the study offer valuable insights into the complex interplay of stakeholder pressures and collaboration dynamics in shaping CE practices adoption within manufacturing SMEs in Estonia. While the proposed conceptual model provides a solid theoretical framework for understanding these dynamics, the empirical findings suggest the need for a more nuanced and context-specific approach to examining the relationships between variables. By critically assessing the findings in relation to the proposed model, this study contributes to advancing the understanding of the factors influencing sustainability practices adoption in SMEs and provides a foundation for further research in this area.

### **4.3. Practical Implications**

The findings of this study hold significant practical implications for manufacturing SMEs in Estonia seeking to transition towards CE practices. Firstly, the identification of key pathways and factors influencing CE adoption provides SMEs with valuable insights into the specific conditions and dynamics that drive CE practices within their industry. By understanding the importance of stakeholder pressures, such as those from business and social stakeholders, SMEs can prioritize engagement with these stakeholders to garner support and enhance their sustainability initiatives (Mazzucchelli et al., 2022).

Moreover, the emphasis on collaboration, both on the demand and supply sides, underscores the importance of fostering partnerships and alliances to facilitate the integration of CE principles into business operations (Sudusinghe & Seuring, 2022). Manufacturing SMEs can leverage collaboration opportunities with customers, suppliers, and other industry stakeholders to share resources, knowledge, and best practices, thereby enhancing their capacity to adopt and implement CE practices effectively. This collaborative approach not only enables SMEs to overcome resource constraints but also fosters innovation and knowledge exchange, driving continuous improvement in sustainability performance (Allenbacher & Berg, 2023).

Furthermore, the recognition of contextual factors and nuances highlighted in the study emphasizes the need for SMEs to adopt a tailored and context-specific approach to CE adoption (Kumar et al., 2023). Rather than adopting a one-size-fits-all strategy, SMEs should assess their unique circumstances, including market dynamics, regulatory environment, and stakeholder expectations, to develop customized sustainability strategies that align with their goals and capabilities. This strategic approach enables SMEs to capitalize on their strengths while addressing potential barriers and challenges associated with CE adoption.

Additionally, the study's focus on configurational theory and the complex interactions among variables underscores the importance of taking a holistic and systems thinking approach to sustainability (Berg-Schlusser et al., 2009). SMEs should consider the interconnectedness of various factors influencing CE adoption and strive to achieve synergies among different initiatives and activities. By integrating CE principles into their overall business strategy and decision-making processes, SMEs can create value, enhance competitiveness, and contribute to long-term sustainable development.

## **CONCLUSION**

This thesis investigated the adoption of CE practices among manufacturing SMEs in Estonia. The aim was to understand the factors influencing CE practices and their interplay within the SMEs context by investigating the interplay of stakeholder pressures, collaboration dynamics, and contextual factors, the study provides valuable insights into the pathways influencing CE adoption. Through a careful analysis utilizing QCA, the research identified three distinct pathways influencing the adoption of CE practices.

The findings underscore the significance of stakeholder engagement, both from the demand and supply sides, in driving sustainability initiatives within SMEs. Collaborative efforts with customers, suppliers, and other stakeholders emerge as critical drivers for identifying and implementing CE practices effectively. Moreover, social pressure and business pressure play complementary roles in motivating SMEs to embrace sustainability, highlighting the importance of aligning with societal expectations while navigating competitive dynamics.

The study emphasizes the need for SMEs to strategically engage with stakeholders, foster collaboration across the supply chain, and adapt their strategies to contextual factors to effectively transition towards CE practices. By understanding their unique circumstances and leveraging collaboration opportunities, SMEs can overcome barriers and capitalize on opportunities to integrate CE principles into their operations. This strategic approach not only enhances competitiveness but also contributes to environmental sustainability and societal well-being (Fobbe & Hilletoft, 2023; Sudusinghe & Seuring, 2022).

### **Study Limitations and Future Research Directions**

Despite the valuable insights gained from this study, several limitations warrant consideration. Firstly, the research focused exclusively on manufacturing SMEs in Estonia, limiting the generalizability of the findings to other contexts (Schneider & Wagemann, 2012). Future studies



could explore CE adoption across different industries and geographical regions to provide a more comprehensive understanding of the phenomenon.

Secondly, the study relied on self-reported data collected through surveys, which may be subject to biases and inaccuracies (Ragin, 2009). Future research could incorporate multiple data sources and methodologies, such as interviews and case studies, to triangulate findings and enhance the validity of the results.

Additionally, the study primarily focused on identifying pathways to CE adoption, overlooking potential barriers and challenges faced by SMEs in implementing CE practices (Elia et al., 2020). Future research could delve deeper into the barriers hindering CE adoption and explore strategies to overcome these obstacles effectively.

Furthermore, the study did not consider the influence of external factors such as macroeconomic trends, technological advancements, and policy frameworks on CE adoption (Khan et al., 2023). Future research could investigate the interplay between these external factors and internal organizational dynamics to provide a more holistic understanding of CE adoption processes.

In conclusion, while this study offers valuable insights into the factors influencing CE adoption among manufacturing SMEs in Estonia, there is still much to explore (Kumar et al., 2023). Addressing the aforementioned limitations and pursuing future research directions can further advance the understanding of CE adoption and contribute to the development of effective strategies to promote sustainability within SMEs and beyond.

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