Action or Reaction? Entrepreneurial and Market Orientation for Implementing Circular Economy Practices in German SMEs

Antonia Hoffmann and Nils Marticke
School of Management – Chair of Management Accounting, Technical University of Munich, Germany

antonia.hoffmann@tum.de
nils.marticke@tum.de

Abstract: Circular Economy (CE) is one of the most promising practices in sustainable business development and achieving climate targets. Small and medium-sized enterprises (SMEs) play a significant role in this context due to their predominance in many countries and their associated ecological impact. Although studies indicate that CE offers various environmental and economic benefits, its implementation within SMEs remains relatively low. While SMEs face multiple challenges and barriers, there remains a lack of insights into the factors that can accelerate CE practices. A promising approach to overcoming these challenges involves strategic orientations. This study examines two specific strategic orientations, market orientation and entrepreneurial orientation, and their relationship with CE implementation in SMEs. Therefore, survey data from 757 German SMEs were analysed using multiple linear regression, which resulted in multifaceted insights. Both market orientation and entrepreneurial orientation positively influence CE implementation. Market orientation and entrepreneurial orientation demonstrate varying joint relationships, with entrepreneurial orientation acting as an enabler in the mediation between market orientation and CE. This study contributes to a deeper understanding of the relationships between various factors influencing the implementation of CE practices in SMEs. In particular, it provides the basis for further research into the interplay between market orientation and entrepreneurial orientation and their joint influence on CE. Practitioners in SMEs should not only integrate market orientation and entrepreneurial orientation as a holistic approach but, more specifically, seek to establish a culture that encourages innovativeness and risk-taking and deepen further marketing efforts throughout the organization to facilitate CE implementation. This ultimately leads to ecological sustainability and financial improvements in SMEs.

Keywords: Circular economy, Strategic orientation, Marketing orientation, Entrepreneurial orientation, Small and medium-sized enterprises

1. Introduction

Circular economy (CE) is regarded as one of the most relevant approaches in transitioning businesses towards sustainable practices (Murray, Skene, & Haynes, 2017). It is increasingly recognized as a transformative approach to sustainable development, changing the traditional linear economic model of "take, make, dispose" into a regenerative system that aims to minimize waste and use resources efficiently (Ellen MacArthur Foundation, 2013, p. 2). The Ellen MacArthur Foundation further emphasizes that CE can significantly address climate change, reduce biodiversity loss, and curb environmental pollution. Despite the numerous benefits a CE is purported to offer, its implementation remains relatively low (De Pascale et al., 2023). While previous literature mainly examined the reasons for the lack of implementation of CE in larger companies, there is a clear gap in the effects of small and medium-sized enterprises (SMEs) on CE implementation (Madrid-Guijarro & Duréndez, 2024). SMEs are regarded as one of the most promising contexts for applying CE practices (Al-Awlaqi & Aamer, 2022).

Prieto-Sandoval, Jaca, and Ormazabal (2018) indicate that SMEs can achieve several benefits and opportunities by embracing CE practices, such as enhancing brand reputation, reducing operation costs, business expansion, increasing productivity, environmental recovery through lower CO2 emissions, and gaining a competitive edge. But the researchers also reveal that the primary motivation of SMEs to adopt CE is the potential to save costs, rather than build brand reputation or respond to regulatory pressure. However, SMEs are lagging behind in the development of sustainable measures (Álvarez Jaramillo, Zartha Sossa, & Orozco Mendoza, 2019). Effective implementation of CE relies on various internal and external organizational elements (Prieto-Sandoval et al., 2018). Strategic orientations play a promising role in overcoming these challenges and facilitating the implementation of the CE in SMEs (Kirchherr, Reike, & Hekkert, 2017; Schmidt et al., 2021). Specifically, market orientation (MO) and entrepreneurial orientation (EO) are regarded as positive influencers on CE implementation in SMEs (Saari et al., 2024; Schmidt et al., 2021). MO thereby reflects the degree to which strategic market planning is influenced by customers, competitors, suppliers, and governmental agencies, while EO refers to the priorities that companies set for identifying and leveraging market opportunities (Shane & Venkataraman, 2000). Although several studies have already suggested a positive relationship between these two strategic orientations and CE implementation, it is nonetheless observed that strategic moves

towards CE by SMEs remain an under-researched topic (Cullen & De Angelis, 2021), which this study aims to further illuminate. This paper contributes to the literature by answering the following research questions: *Do MO and EO facilitate CE implementation in SMEs?*

2. Theoretical Background and Hypotheses

While CE gained prominence in the 1970s, academic interest in the field has intensified recently with numerous reviews, concepts, and practical guidelines (Geissdoerfer et al., 2017). The probably best-known definition in recent years is by the Ellen MacArthur Foundation (2013, p. 7), which defines CE as „an industrial system that is restorative or regenerative by intention and design." The Ellen MacArthur Foundation further argues that CE promotes the use of renewable energy and shifts the focus from a buy-and-consume model to a user-centric approach that emphasizes durable products, embraces modularity, and eliminates waste through products optimized for disassembly and reuse. A popular concept for implementing CE was developed by Bocken et al. (2016); Konietzko, Bocken, and Hultink (2020), who created a framework to guide designers and business strategists in transforming from a linear economy to a CE. The authors refer to four types of the cycling of resources: slowing resource loops aims to extend the life of products and resources, thus reducing the total number of products made and disposed of over time; narrowing resource loops involves using less material and energy throughout a product's lifecycle; closing resource loops focuses on creating a cycle where materials are reused, remanufactured, or recycled at the end of their life, transforming waste into a resource for new products; regenerate comprises the use of non-toxic materials and renewable energies, as well as the regeneration of natural ecosystems. Overall, CE offers enormous potential for SMEs, but they still face many challenges that must be addressed. It is, therefore, essential to examine factors that can positively influence the implementation of CE in SMEs. As outlined in the introduction, the strategic orientations of EO and MO are regarded as possible enablers in the implementation of CE in SMEs (Al-Awlaqi & Aamer, 2022; Saari et al., 2024; Schmidt et al., 2021).

2.1 Market Orientation and Circular Economy

Theoretical origins primarily go back to the 1990s, when Kohli and Jaworski (1990, p. 1) initially presented MO as a construct to implement a marketing concept and argued that "a market-oriented organization is one whose actions are consistent with the marketing concept". While this model primarily focuses on the behavioural aspects of MO, Narver and Slater (1990) it focuses on the cultural approach within the organization and points out that a lived MO culture reflects that of the customer and the market. SMEs tend to develop closer relationships with their customers Coviello, Brodie, and Munro (2000), which makes the dimension of customer focus even more pronounced in SMEs. The regionality of the companies could explain this and since SMEs have an economic incentive to align their actions with their customers (Raju, Lonial, & Crum, 2011). MO is identified as a precursor to commitment to sustainability (Jansson et al., 2017), which in turn can be seen as a predictor of CE implementation (Hoffmann & Kühnhold, 2023). Regarding the impact of MO on CE implementation in SMEs, besides the mentioned study by Schmidt et al. (2021), the research investigated that MO can positively impact corporate social responsibility in SMEs (Raza, Liu, & Usman, 2019). Given the positive relationship between corporate social sustainability measures and CE implementation (Rondinelli & Berry, 2000), it is plausible to assume that MO similarly influences CE implementation in SMEs.

Overall, the literature provides a comprehensive overview of the influence of MO on CE implementation in SMEs, from which we derive the following:

Hypothesis 1. MO positively influences CE implementation in SMEs.

2.2 Entrepreneurial Orientation and Circular Economy

EO refers to the priorities that companies set for identifying and leveraging market opportunities (Shane & Venkataraman, 2000). Its roots trace back to the 1970s when Mintzberg (1973) observed that entrepreneurial firms were more inclined to take risks and were more proactive in the marketplace. Studies found that a strong EO significantly influences innovation and the creativity of new products in SMEs rather than in larger organizations (Yi, Amenuvor, & Boateng, 2021). Saari et al. (2024) indicate that EO can assist companies in implementing new CE-oriented business models and deriving a competitive advantage from them. Furthermore, research points out that CE-related challenges and EO can work together (E. A. Khan et al., 2022), and human resources-related aspects, such as EO, are crucial for adapting business models in the transition towards CE (Bertassini et al., 2021). Although various studies indicate a positive relationship between EO and CE implementation, there is a lack of research on the direct relationship in SMEs (Ferreira & Ferreira, 2023). However, the literature suggests a positive relationship between EO and sustainable practices

in general in SMEs. For instance, EO positively influences sustainable environmental development (Ayuso & Navarrete-Báez, 2018), commitment to sustainability (Jansson et al., 2017), and investment in sustainability initiatives (Mullens, 2018). Consequently, EO promotes sustainable practices in SMEs, which may also include CE. As a result of this assumption and given the amount of literature linking EO with successful CE implementation, SMEs with a distinct EO should be more likely to implement CE. Hence, we posit that:

Hypothesis 2. EO positively influences CE implementation in SMEs.

2.3 The Mediating Effect

Jansson et al. (2017) raised the question of the extent to which EO and MO might significantly impact each other. The literature suggests that MO could be an antecedent to EO in SMEs (Morgan & Strong, 1998). In particular, identifying customer needs and observing competitors' activities can facilitate a strong EO and promote proactive action in the market environment (Seilov, 2015). This aligns with other research highlighting that companies develop a strong EO when they are already market-oriented, enabling them to implement innovative projects that are not only inspired by the market environment (González-Benito, González-Benito, & Muñoz-Gallego, 2009). While empirical studies point towards a mediation effect of EO in relation to MO (Acar et al., 2013), there is still no empirical research that provides evidence for the positive influence within the context of CE and SMEs. To fill this gap and under the assumptions established in the previous chapters that MO and EO have a positive impact on CE in SMEs, that MO acts as an antecedent of EO, and that EO can further act as an enabler for MO, the following hypothesis is proposed (see Figure 1):

Hypothesis 3. EO mediates the positive relationship between Mo and CE implementation in SMEs.

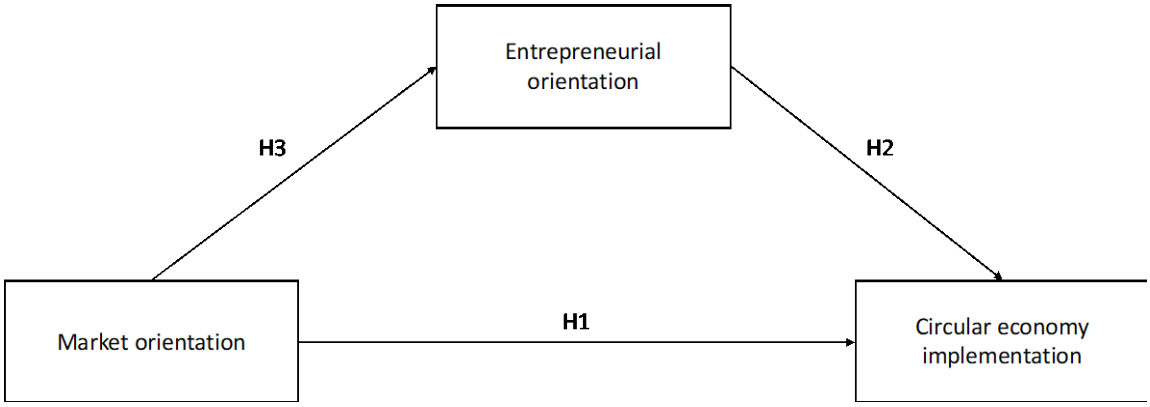

Figure 1: Research model

3. Methodology

3.1 Sample and Data Collection

We focused on German SMEs since they are well-suited for investigating CE (Schmidt et al., 2021). After certain pre-testing, a self-administered online survey was distributed via email to contact 15,034 German SMEs. The data collection took place between August 2022 and September 2022. A total of 820 surveys were completed and returned from SME managers. In this study, only survey results that provided a valid response to all CE, MO, and EO items were considered for analysis. This reduced the number of valid and usable results to 757. Table 1 contains descriptive statistics of the sample.

Table 1: Descriptive statistics

Segment	**Frequency**	**%**		**Sales**	**Frequency**	**%**
Production	171	22.7		< €22,000	39	5.2
Services	344	45.6		€22,000 - < €50,000	52	7.0
Both	240	31.8		€50,000 - < €125,000	95	12.7
Total	**755**			€125,000 - < €250,000	105	14.0
				€250,000 - < €500,000	179	23.9

Gender	**Frequency**	**%**		€500,000 - < €2,500,000	225	30.1
Female	60	8.0		€2,500,000 - < €5,000,000	32	4.3
Men	688	91.4		> €5,000,000	21	2.8
Diverse	5	0.7		**Total**	**748**	
Total	**753**					
Firm age	**Frequency**	**%**		**Firm size (number of employees)**	**Frequency**	**%**
<= 5 years	66	8.7		1	149	19.7
6 - 20 years	222	29.4		2 - 4	210	27.8
21 - 35 years	233	30.9		5 - 9	217	28.7
>= 36 years	234	31.0		10 - 19	110	14.6
Total	**755**			20 - 49	54	7.2
				>= 50	15	2.0
				Total	**755**	

3.2 Measurement

CE, MO, and EO were illustrated in the theoretical foundation as constructs that also consist of sub-dimensions. This poses the challenge that dimensions of constructs are not directly observable, which means they are latent. Thus, it is necessary to operationalize them (Hair et al., 2019). In the following, the variables are introduced. Table 2 presents the study's variable measures.

Table 2: Item survey questions

Variable	**Item**	**Question**
CE	ce1_1	Do you design and develop products that can be easily repaired? (Spare parts and repair possibilities available, economic efficiency of repair given).
	ce2_1	Do you design and develop products that are easy to maintain (e.g., easy monitoring and control of functionality)?
	ce3_1	Do you design and develop products that are recyclable (e.g. easily separable)?
	ce4_1	Do you use products (not packaging) made from recycled material?
	ce5_1	Do you design and develop products that are biodegradable (e.g. no hazardous substances, fast decomposition)?
	ce6_1	Do you use products (not packaging) that are biodegradable?
	ce7_1	Do you use packaging that is biodegradable and/or reusable?
	ce8_1	Are there closed loops in production (e.g. return/recycling of product residues into production, waste as raw material)?
	ce9_1	Do you increase the material and energy efficiency of your business by achieving the same result with less material and energy input?
	ce10_1	Do you reduce your waste by passing on by-products (e.g. products resulting from a manufacturing process whose main purpose is to produce another product; production residues)?
	ce11_1	Do you procure by-products from other companies/organizations?
	ce12_1	Do you provide repair services for customers?

Variable	Item	Question
	ce13_1	Do you provide maintenance services for customers? (e.g. monitoring and control of product functionality)
	ce14_1	Do you use materials that have been used before (e.g. old products)?
	ce15_1	Do you rent and share tools, machines, or facilities/rooms?
MO	mo1_1	We periodically review our product development efforts to ensure that they are in line with what customers want.
	mo1_2	In our organization, marketing personnel spend time discussing customers' future needs with different functional departments.
	mo1_3	Data on customer satisfaction are disseminated at all levels of the organization on a regular basis.
	mo2_1	We are slow to detect fundamental shifts in our market (competition, technology, etc.).
	mo2_2	We are slow to detect changes in our customers' preferences.
	mo3_1	The customers' interests always come first, ahead of the level of profitability.
	mo3_2	This organization exists primarily to serve customers.
	mo3_3	The business objectives of our organization are driven by customer satisfaction.
EO	eo1_1	I introduced and favored many product or service innovations in my company
	eo1_2	I marketed very many new lines of products or services in my company
	eo1_3	I made minor changes in product or service lines offered by my company.
	eo2_1	I tend to strongly favor high-risky projects (with chances of very high returns).
	eo2_2	Owing to the nature of the environment, I favor bold and wide-ranging acts to achieve the company's objectives.
	eo2_3	I typically adopt a bold and aggressive posture in order to maximize the probability of exploiting potential opportunities.
	eo3_1	I am very seldom the first business to introduce new products/services, management techniques or operating technologies in my company.
	eo3_2	I typically respond to actions which competitors initiate rather than preceding them.
	eo3_3	I typically have a tendency to follow up competitors to adapt to the market rather than anticipating it.

Dependent variable – CE. The dependent variable CE was measured using 15 items on a 5-point Likert scale (1 = "currently not planned", 5 = "successfully implemented"). The items were based on O. Khan, Daddi, and Iraldo (2021) and were slightly adapted to reflect the specific conditions of the German SME market. In addition, the option "not possible in my company" was integrated to identify companies unable to implement CE practices. The holistic construct of CE (α = .79) showed a satisfactory value for Cronbach's alpha.

Independent – MO. MO consists of 8 items based on the scale by Jansson et al. (2017). The items were measured on a 4-point Likert scale (1 = "Does not apply", 4 = "Applies"). The holistic construct had a Cronbach's alpha slightly below the threshold of .7 (α = .64).

Independent – EO. EO was measured using nine items based on the scale by Khedhaouria, Gurău, and Torrès (2015). These items were rated on a four-point Likert scale (1 = "strongly disagree", 4 = "strongly agree"). The resulting holistic construct showed satisfactory internal consistency, which was supported by a sufficient Cronbach's alpha (α = .78).

Control variables. Following earlier research in the field of SMEs, we control for segment, sales, firm age, the number of employees, and gender (Saari et al., 2024; Schmidt et al., 2021).

4. Analysis and Results

4.1 Multiple Linear Regression Assumptions

Verifying certain model assumptions is essential to ensure an unbiased estimation of the regression models. The models were first checked for fulfilment with the four basic assumptions of the Gauss-Markov theorem, as set out by Urban and Mayerl (2018) (see Table 3).

Firstly, homoscedasticity states that the variance of the error terms must be constant across all observations. To test this assumption, the White-Test was used, which applies the squared residuals to test the null hypothesis, confirming the absence of heteroscedasticity (White, 1980). If the null hypothesis is rejected and heteroscedasticity is present, the use of robust standard errors is indicated (Long & Ervin, 2000). Most of the hypothesis models showed a p-value of less than .05, which indicates heteroscedasticity. To correct this assumption violation and achieve consistent results throughout the hypothesis models, robust standard errors were used, which are contained as a standard function in STATA. The second assumption, that the expected value of the error terms is zero, cannot be tested directly in practice. However, violating this assumption would not pose a significant problem for the quality of a hypothesis model (Urban & Mayerl, 2018). According to the third assumption, there should be no autocorrelation of the error terms, as they must be independent. The Durbin-Watson test (Durbin & Watson, 1950) was used to measure the autocorrelation of the error terms, whereby a value range of 1.5 to 2.5 is interpreted as an indicator of the absence of autocorrelation (Urban & Mayerl, 2018). The test results of all hypothesis models were within the prescribed range. Therefore, no corrections were necessary (see Table 3). The fourth and final basic assumption concerns the absence of multicollinearity, which is the perfect linear independence of the dependent variables. The Variance Inflation Factor (VIF) was used as a metric for verification, as a bivariate correlation test between two variables in a model with several independent variables might not provide sufficient information about multicollinearity (Urban & Mayerl, 2018). A VIF value of 1.0 implies the absence of multicollinearity, whereas a threshold value of 4.0 is considered good (Urban & Mayerl, 2018).

Table 3: Assumption tests of regression analysis

Hypothesis	Description	White-Test	Durbin-Watson-Test	VIF
H1	MO → CE	.00	1.86	2.19
H2	EO → CE	.00	1.82	2.20
H3	MO → CE	.00	1.86	2.19
	MO → EO	.00	1.97	2.19
	MO + EO → CE	.00	1.82	2.16

4.2 Regression Analysis

The results of the hypothesis tests with the multiple linear regression analysis are presented below. In a model containing only control variables and the independent variable CE, the segment has a statistically significant effect on CE implementation. SMEs exclusively offering services have a lower average level of CE implementation (ß = -.62, p = .00), whereas companies offering both products and services exhibit a higher level of CE implementation (ß = .43, p = .00). Sales and company age do not show a statistically significant influence on CE implementation, while the logarithmic calculus of employees indicates a negative, yet marginally non-significant influence at the 5% level on the dependent variable CE (β = -.10, p = .07). Male CEOs are associated with a higher average level of CE implementation compared to female CEOs (ß = .32, p = .01), whereas the effect for CEOs identifying as diverse is not statistically significant (model 1).

Hypothesis 1 addresses the influence of MO as a holistic construct on CE as a holistic construct. MO has a positive statistically significant effect on CE implementation in SMEs (ß = .32, p = .00), confirming hypothesis 1 (model 2). Hypothesis 2 relates to the influence of EO as a holistic construct on CE as a holistic construct. EO has a positive, significant influence on CE implementation (ß = .54, p = .00), thus confirming hypothesis 2 (model 3). The results are shown in Table 4.

Table 4: Results of regression analysis

CE (dependent variable)	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Constant	ß	ß	ß	ß
MO		.32***		.32
EO			.54***	.79*
Segment (Production as base)				
Services	-.62***	-.59***	-.60***	-.59***
Both (Production & Services)	.43***	.42***	.40***	.40***
Sales (< €22,000 as base)				
€22,000 - < €50,000€	-.09	-.11	-.08	-.09
€50,000 - < €125,000€	-.07	-.09	-.06	-.07
€125,000 - < €250,000€	-.04	-.10	-.07	-.09
€250,000 - < € 500,000€	-.07	-.14	-.11	-.13
€500,000 - < € 2,5 mil.	.02	.01	.03	.02
€2.5 mil. - < €5 mil.	.12	.11	.05	.06
> €5 mil.	.07	.06	-.00	.01
Firm age (log)	-.03	-.02	-.03	-.02
Employees (log)	-.10*	-.13**	-.18***	-.18***
Gender (Female as base)				
Male	.32**	.33***	.14	.16
Diverse	.78	.77	.59	.59
Observations	740	740	740	740
R-squared	.21	.23	.28	.28
F	16.2***	17.6***	22.8***	2.6***

Note. *p < .10 **p < .05 ***p < .01; N = 757.

Hypothesis 3 states that EO mediates the relationship between MO and CE implementation. When testing the first step (total effect), the influence of MO on CE is positive and significant (ß = .32, p = .00). The second step, testing the indirect effect using bootstrapping, further indicates that the relationship between MO and CE implementation is mediated by EO (ß = .22, CI[.14, .29], p = .00). The third step, testing the direct effect, confirms a full mediation, due to a non-significant direct effect (ß = .10, p = .24), thus hypothesis 3 can be accepted. Detailed results are presented in Table 5.

Table 5: Results of mediation analysis

CE	**H6**
a coefficient (MO → EO)	.43***
b coefficient (EO + MO → CE)	.51***
Step 1: Total effect	.32***

CE	H6
Step 2: Indirect effect	.22***
95% conf. interval	[.14, .29]
Step 3: Direct effect	.10
Note: *** p<.01, ** p<.05, * p<.1	

5. Discussion and Conclusion

The focus of this study lies in the relationship between MO, EO, and CE implementation in SMEs. MO and EO positively relate to CE implementation (hypotheses 1-2). Furthermore, EO mediates the positive relationship between MO and CE implementation (hypothesis 3).

5.1 Theoretical Implications

5.1.1 Influence of MO on CE

The positive and statistically significant effect of MO on the implementation of CE in SMEs confirms hypothesis 1. This emphasizes the assumption that a high level of MO within an SME, which encompasses an integration of marketing within the whole organization and a comprehensive understanding of customer needs, competitor actions, and market trends, is helpful to implementing CE in SMEs. The results of this study further confirm those of the existing literature (Schmidt et al., 2021) and provide a more comprehensive understanding of the influence of MO on CE in SMEs. Furthermore, the results support the findings by Wasim et al. (2024) and thus extend this from the Scottish to the German context. Hence, This study bridges the research gap on whether a pronounced MO can facilitate the implementation of CE in SMEs.

5.1.2 Influence of EO on CE

The empirical findings in this study provide robust support for the proposed hypothesis 2 that EO has a positive and significant impact on the implementation of CE practices in SMEs. This outcome aligns with recent research and emphasizes the positive relationship between EO and CE-oriented practices (Bertassini et al., 2021; E. A. Khan et al., 2022; Saari et al., 2024). This underlines EO's role in encouraging an organizational culture that is open to innovation, taking risks, and the proactive pursuit of new business opportunities, which are essential for the successful implementation of CE. Furthermore, this study contributes to the understanding of the relationship between EO and CE implementation and extends the current literature by focusing on the context of SMEs, which has not yet been sufficiently examined (Ferreira & Ferreira, 2023).

A pronounced EO positively affects the implementation of CE, thereby empirically confirming the previous findings of the literature (Saari et al., 2024). This study provides significant value as it empirically demonstrates the positive relationship within the context of SMEs for the first time, responding to prior calls from the literature (Ferreira & Ferreira, 2023) and accordingly expanding the body of knowledge.

5.1.3 Mediating effect of EO

The confirmation of hypothesis 3 demonstrates that EO acts as a mediator in the relationship between MO and the implementation of CE in SMEs. The findings indicate that the positive influence of MO on the implementation of CE in SMEs depends on the presence of a pronounced EO. Thus, EO also serves as an enabler for MO (Acar et al., 2013). An explanation for this positive effect might be that the characteristics of EO ensure the insights gained from MO about the market and consumers are transformed into concrete entrepreneurial actions, thereby practically advancing the implementation of CE. This is in line with further research that indicated that a strong MO without a strong EO may focus on the customer but might not have the capabilities to meet their demands (Baker & Sinkula, 2009), which could be sustainability aspects such as the need for CE implementation.

This study makes a novel contribution to the understanding of the interplay between MO and EO in the context of CE implementation in SMEs. Thereby, it addresses the call from Jansson et al. (2017), who questioned whether EO and MO act jointly or if one variable influences the other. EO acts as a mediator in the relationship between MO and CE. This confirms the assumptions from studies in a similar environment (Acar et al., 2013) and extends the current literature by providing empirical evidence in the context of SMEs in the German market. It further indicates that MO acts as an antecedent for EO. In addition, insights into the complex relationship between EO and MO are obtained, providing a basis for future researchers to investigate.

5.2 Managerial and Practical Implications

In addition to a theoretical contribution, practical implications can also be drawn. Firstly, a pronounced MO within a SME is conducive to the implementation of CE. Accordingly, practitioners should strive to deepen their MO by integrating marketing efforts across the organization and developing a thorough understanding of customer needs, competitor actions, and market trends to adopt CE practices more effectively. SMEs should focus on creating and enhancing internal processes that promote cross-functional collaboration and strategic alignment towards sustainability objectives within the organization and not just by individual areas or departments.

Secondly, practitioners should strive to establish a strong EO culture within the organization, which is essential for implementing CE practices in SMEs. This entrepreneurial approach can lead to the development of new products, services, and processes that support environmental sustainability. In particular, practitioners should seek to foster a culture that encourages innovativeness and risk-taking to create the best possible environment for sustainability-driven practices, such as CE implementation. EO demonstrates a unique ability to positively impact all areas of the cycle, which will further support practitioners in reaching sustainability.

Thirdly, the combined focus on MO and EO should be carefully considered. The mediating role of EO suggests that a synergistic approach to integrating market insights with entrepreneurial actions is beneficial for SMEs. Practitioners should, therefore, strive to implement both strategic orientations within their companies to enhance CE implementation. In this context, it may be particularly valuable for practitioners to leverage their market and customer knowledge gained through a strong MO to promote these insights within a pronounced EO culture, thereby developing sustainable measures for CE practices.

6. Conclusion

This study expands the existing literature concerning factors that positively influence CE implementation in SMEs. Using linear regression, it specifically highlights the impact of MO and EO on CE implementation and the mediating effect. The findings reveal a positive relationship between MO and EO with CE implementation in SMEs. Besides making a significant contribution to the literature, this study also provides subjects for future research. It encourages future researchers to investigate the relationship between MO and EO further by focusing more on the sub-dimensions. Furthermore, this study provides practitioners with recommendations to facilitate the implementation of CE in SMEs. Besides integrating a distinct MO and EO, it encourages creating a culture that promotes innovativeness and risk-taking and deepens marketing efforts across the entire organization to advance the implementation process.

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