Stakeholder Pressure on Corporate Environmental Responsibility in SMEs

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Summary: This research delves into how stakeholder pressure influences Small and Medium-Sized Enterprises' (SMEs) Corporate Environmental Responsibility (CER). Using survey data from 173 Swiss and German SMEs, the study employs structural equation modeling to analyse the effect of perceived pressure from stakeholders, benefits and barriers on CER. The study found that internal stakeholder pressure directly and positively affects CER in SMEs, and perceived barriers do not significantly impede it. The results indicate that perceived external stakeholder pressure indirectly impacts SMEs' CER through perceived economic benefits, but not directly. The findings have important implications for policymakers, financial institutions, and other stakeholders who aim to promote environmental responsibility in SMEs.

Keywords: Stakeholder, SME, sustainability, environmental responsibility, pressure, benefits, barriers, family equity

Anspruchsgruppendruck auf die unternehmerische Umweltverantwortung von KMU

Zusammenfassung: Diese Studie untersucht, wie Druck der Anspruchsgruppen die unternehmerische Umweltverantwortung (CER) von kleinen und mittleren Unternehmen (KMU) beeinflusst. Mit Strukturgleichungsmodellen und anhand von Umfragedaten von 173 Schweizer und deutschen KMU werden die Effekte von wahrgenommenem Druck von Anspruchsgruppen, Vorteilen und Hürden auf die unternehmerische Umweltverantwortung analysiert. Die Studie ergab, dass Druck von internen Anspruchsgruppen die Umweltverantwortung von KMU direkt und positiv beeinflusst, während wahrgenommene Hürden diese nicht signifikant beeinträchtigen. Die Ergebnisse deuten darauf hin, dass sich der wahrgenommene Druck von externen Anspruchsgruppen indirekt über die wahrgenommenen ökonomischen Vorteile, aber nicht direkt auf die Umweltverantwortung von KMU auswirkt. Die Ergebnisse haben wichtige Implikationen für politische Entscheidungsträger, Finanzinstitute und andere Interessengruppen, die die Umweltverantwortung von KMU fördern möchten.

Stichworte: Anspruchsgruppen, KMU, Nachhaltigkeit, Umweltverantwortung, Druck, Vorteile, Hürden, Familieneigenkapital

1 Introduction

Since the 2015 Paris Climate Agreement (United Nations, 2015), climate change and environmental damage have gained substantial attention in academic and professional communities. Small and medium-sized enterprises (SMEs), substantially impacting the en-

vironment (Hillary, 1995), are forming a major part of the European economy (Calogirou et al., 2010; Mitchell et al., 2011; Reuter et al., 2021). Yet, what drives their Corporate Environmental Responsibility (CER) is unclear. This study addresses this gap by testing the influential path of internal and external stakeholder pressure on SMEs' CER.

For the analysis, SMEs are defined as firms with three to 249 employees, regardless of balance sheet total or annual turnover. Common definitions of Corporate Social Responsibility (CSR) include environmental responsibility as a key dimension[1]. Under the concept of double materiality (European Commission, 2019), environmental factors can be financial and/or impact material. This study aligns with the impact materiality perspective, defining CER as company actions and policies adopted to minimise negative ecological impact.

The focus of CSR and CER research primarily centres on large corporations (Nejati & Amran, 2012), which extensively disclose sustainability information, enabling quantitative analyses. Transferring these findings directly to SMEs is problematic due to differing CSR strategies, organisational structures, and stakeholder roles. These dissimilarities highlight the necessity for independent examination of SMEs within the CER context. Further, CSR studies are blending its social and environmental dimensions, making it difficult to determine whether the driving factors behind them are equal or distinct. This study contributes to the current understanding of CER drivers among SME, offering a nuanced understanding of the direct and indirect mechanisms through which stakeholders shape SMEs' environmental actions.

The study examines the effect of perceived stakeholder pressure on CER. Stakeholder theory emphasises considering various stakeholders beyond shareholders in organisational planning, as their interests possibly convert into stakeholder pressure. Legitimacy theory underscores the need for socially responsible actions to maintain a positive societal perception and to secure the "licence to operate". Institutional theory highlights structural changes under pressure to align with social norms. While most prior studies lack differentiation among stakeholders, this study deliberately distinguishes between perceived internal and external stakeholder pressure.

Previous studies mainly explored the direct impact of stakeholder pressure on organisational sustainability (Agan et al., 2013; Brammer et al., 2012; Hillary, 2004; Zameer et al., 2021). However, rational choice and resource-based theories suggest a potential mediating role in this relationship. Rational choice theory (Von Neumann & Morgenstern, 1944) suggests that individuals are more likely to engage in a behaviour if they perceive benefits. The firm's behavioural theory (Cyert & March, 1963) extends the path by which perceived benefits in turn are shaped by pressure through obligation, social learning, and legitimacy. Resource-based theory emphasises the availability of resources in determining environmental-friendly actions: SMEs' limited resources can result in high costs and expertise deficiencies. Only a few previous studies tested pressure's indirect influence on sustainability: Graafland and Smid (2017) linked social licence pressure to environmental performance via perceived market benefits and Cantele and Zardini (2020) examined pressure's impact through benefits and barriers, revealing some significant mediated effects

1 The official definition from the Swiss State Secretary for Economic Affairs and the European Commission considers the environmental dimension as an integral part of CSR (European Commission, 2011; Federal Council, 2020).

but without distinguishing internal or external pressure, leaving unclear whether these effects could be attributed to one, the other, or both.

Based on existing literature and theories, this study analyses perceived benefits, perceived internal and external pressure, as well as perceived barriers as determinants of CER among SMEs and examines the following underlying hypotheses:

I) Perceived Internal Pressure positively affects CER
II) Perceived External Pressure positively affects CER
III) Perceived Benefits positively affect CER
IV) Perceived Barriers negatively affect CER
V) Perceived Internal Pressure indirectly affects CER through Perceived Benefits
VI) Perceived Internal Pressure indirectly affects CER through Perceived Barriers
VII) Perceived External Pressure indirectly affects CER through Perceived Benefits
VIII) Perceived External Pressure indirectly affects CER through Perceived Barriers

Perceived pressure, benefits, and barriers, as well as CER, are abstract constructs without a clear measurable physical or observable form. To assess these constructs, latent variables are employed, using observable indicators believed to be associated with the underlying construct.

The analysis is based on survey data collected in summer 2022 as part of the Enterprise Risk Management Report by the Lucerne and Kiel Universities of Applied Science. The survey was distributed through various channels, including Swiss and German industry associations, and a representative subset of 500 Swiss SMEs. The sample was enlarged by randomly contacting 700 SMEs and using social network. The final sample includes 173 SMEs from all industries and sizes, except for the financial and agricultural sector. In the sample, the number of sustainable companies only slightly exceed the number of non-sustainable firms. The study used structural equation modeling (SEM) to examine the correlation and potential path between stakeholder pressure and CER.

A significant positive relation is revealed between Perceived Internal Pressure (employees, management, and owner) and CER (H I). A direct influence from Perceived External Pressure (financial institutions, legislation, local community, competitors, and clients) on CER remains unconfirmed (H II). The data shows, that Perceived Benefits (profitability, labour attractiveness, image, and competitiveness) positively influence CER (H III). There is no clear relationship between Perceived Barriers (costs, lack of time, lack of expertise, and lack of impact) and CER (H IV) in the data. No indirect effect of Perceived Internal Pressure through Perceived Benefits (H V) was measured, but the analysis indicates a statistically significant relationship between Perceived External Pressure on CER through Perceived Benefits (H VII). Also, no indirect effect between Perceived Internal or External Stakeholder on CER through Perceived Barriers can be confirmed (H VI and H VIII).

Cross-sectional data limits the study, warranting further research to validate results over time and in different regions. To address endogeneity, old and young high-CER firms were compared to test bidirectional causality assumptions. No significant differences were found, reducing the model's endogeneity concerns.

The findings are especially important for policymakers, financial institutions, and other stakeholders seeking to promote environmental responsible practices among SMEs. They show that internal stakeholders strongly influence environmental action in SMEs, even without immediate economic benefits. External stakeholder pressure does not directly af-

fect CER but may indirectly do so through perceived benefits. This highlights that external effort to promote SMEs' CER is effective when linked to potential economic advantages.

2 Theoretical Reasoning and Literature Review

Definitions of CSR include social and environmental responsibility as key dimensions[2]. CSR studies blend the two dimensions, making it difficult to determine whether their driving factors are equal or distinct. This study focuses exclusively on the environmental dimension CER. Lyon and Maxwell (2008) define CER as "environmentally friendly actions not required by law, also referred to as going beyond compliance, the private provision of public goods, or voluntarily internalizing externalities". Similarly, Gunningham (2009) defines CER as "practices that benefit the environment (or mitigate the adverse impact of business on the environment) that go beyond that which companies are legally obliged to do". Under the concept of double materiality, introduced by the European Commission (2019), environmental factors can be financial or impact material. Financial materiality refers to the influence of environmental factors on a company's financials, while impact materiality refers to the influence of a company on the environment. Gunningham's (2009) definition focuses on impact materiality and Lyon and Maxwell's (2008) definition does not specify the materiality perspective. This study defines CER as company actions and policies to minimise negative environmental impact. Hence, the focus lies on impact materiality. For measuring the construct, this study employs criteria derived from prior research (ex. Brammer et al., 2012; Cantele & Zardini, 2020; Collins et al., 2007; Eccles et al., 2014). Similar items with varying detail levels of policy adoption regarding emission reduction, energy efficiency, waste management, water management, and product responsibility have been used in earlier literature. Moreover, previous research has integrated external auditing as one aspect.

2.1 SME versus large corporations

Most sustainability studies focus on large corporations (Nejati & Amran, 2012). Usually, large firms disclose and communicate more sustainability information (Baumann-Pauly et al., 2013), which allows for large quantitative studies. However, results from large companies may not directly transfer to SMEs (Eccles et al., 2014; Spence & Rutherfoord, 2003; Thompson & Smith, 1991). Informal CSR strategies prevail among SME, while formal CSR strategies characterise large firms (Russo & Tencati, 2009). Also, the roles and priorities of various stakeholders are expected to vary, due to substantial organisational differences (Bolton, 1971; Jenkins, 2004; Löfving et al., 2016; Samuelsson et al., 2016).

Large firms typically possess formal boards of directors, undergo external audits for transparency as mandated by legislation, and attract more attention from media and Non-Governmental Organizations as well as Non-Profit Organizations, due to their market power. They also face more stringent regulation compared to SMEs. Conversely, SMEs usually have personalised employee-management relationships, strong ties with their local community, and informal interactions with local competitors. These disparities underscore the reasons for the divergence in stakeholders between large firms and SMEs, leading to

2 The official definition from the Swiss State Secretary for Economic Affairs and the European Commission considers the environmental dimension as an integral part of CSR (European Commission, 2011; Federal Council, 2020).

differently prioritised stakeholders. Given these distinctions, it is imperative to separately analyse the impact of SME stakeholders pressure on CER.

2.2 Stakeholder Pressure

Three key theories support the influence of stakeholder pressure on CER: stakeholder theory, legitimacy theory, and institutional theory. Stakeholder theory by Freeman (1984) goes beyond profit maximisation and considers all stakeholders in the strategic planning of an organisation, due to their various interests, possibly converting into stakeholder pressure. Legitimacy theory suggests that companies must undertake socially responsible actions for a positive social perception, and not lose their social "license to operate". Therefore, organisations engage in CSR to legitimise their actions and maintain a positive perception within society (Udayasankar, 2008). Institutional theory (Scott, 2008) states that companies change their structures and behaviours under pressure to satisfy social rules and belief systems.

Daake and Anthony (2000) categorise stakeholders into two groups: The first group actively participates in planning and decision-making, putting forward their interests in the process. The second group's concerns are considered but without active involvement in the process. Internal stakeholders usually belong to the engaged group, whereas external stakeholders are often part of the latter. These groups employ distinct methods to apply pressure on an organisation. Internal stakeholders autonomously exert pressure during the decision-making process. External stakeholders, exert pressure that may influence decision-making processes. Both internal and external stakeholders can be motivated by economic or ethical considerations.

Prior studies highlighting the link between perceived stakeholder pressure and CSR, often failed to differentiate between internal and external stakeholders. However, the meta-analysis from Dasanayaka et al. (2022) found both stakeholder groups relevant to adopting environmental practices. To account for the differences, this study specifically differentiates between perceived internal and perceived external stakeholder pressure.

Based on prior research, this study uses pressure from employees, management, and owners as measurement items for internal stakeholder pressure, and pressure from clients, competitors, legislation, local community, and financial institutions as external stakeholder pressure of SMEs. Employees are key stakeholders in CSR initiatives, as stated by Hillary (2004) and Simpson et al. (2004). Academic studies have also highlighted the importance of management pressure, with different assessment measures, such as "attitude" (Gadenne et al., 2009) or "values" (Testa et al., 2016). Owners are meaningful too with Agan et al. (2013) finding a significant relationship between the moral and social responsibility of owners/managers and improved environmental factors and management systems. Testa et al. (2016) define external pressure using image improvement, regulatory compliance, private and public customer requirements, and competitors' behaviour as measures. Agan et al. (2013) analyse "customer influence" as a latent variable, measuring ways in which clients pressure companies to act in an environmentally friendly manner. Brammer et al. (2012) highlight the importance of public opinion for SMEs operating within local communities. Although Hillary (2004) recognised banks and insurers as relevant stakeholders, financial institutions were mostly not considered when assessing stakeholder pressure on environmental behaviour.

Consequently, this study hypothesises that I) Perceived Internal Pressure positively affects CER, and II) Perceived External Pressure positively affects CER.

2.3 Indirect Effect

Most previous studies have analysed the direct relationship between pressure and organisation sustainability (Agan et al., 2013; Brammer et al., 2012; Hillary, 2004; Zameer et al., 2021). However, according to rational choice and resource-based theory, the effect might be channelled by perceived barriers and benefits.

The rational choice theory (Von Neumann & Morgenstern, 1944) suggests that individuals engage in behaviours for expected benefit. For SMEs engaging in CER, economic benefits include enhanced company image and reputation, improving cost savings, profitability, competitiveness, increasing employee motivation, and attracting potential recruits (Agan et al., 2013; Brammer et al., 2012; Cantele & Zardini, 2020; Hillary et al., 1998; Hsu & Cheng, 2012; Jenkins, 2006; Johnson, 2015; Simpson et al., 2004; Welford, 1995). The firm's behavioural theory (Cyert & March, 1963) further suggests that pressure can shape perceived benefits of environmental engagement by creating a sense of obligation, social learning, and legitimacy concerns. Skinner's (1953) motivation theory suggests individuals perceive benefits due to intrinsic and/or extrinsic factors. According to these theories, a company will act upon stakeholder pressure only if it perceives benefits or can avoid negative effects. Based on previous literature, this study measures perceived benefits with competitive advantage, image improvement, labour attractiveness, and profitability. All the measurements represent economic benefits.

According to resource-based theory, availability of internal resources and capabilities primarily determines firm behaviour, and if a firm does not possess the requisite resources and capabilities to implement environmentally conscious activities, it may be less inclined to engage in them. Per definition, SME possess limited resources. Drawing from the work of numerous researchers, the most relevant barriers are used in this study to measure the construct Perceived Barriers. It consist of too high costs, lack of time, lack of expertise, and too little corporate impact on the environment and on society (Cantele & Zardini, 2020; Collins et al., 2007; Gadenne et al., 2009; Hillary, 2004; Hsu & Cheng, 2012; Revell et al., 2010; Stokes & Rutherfoord, 2000; Studer et al., 2006; Villegas Pinuer et al., 2022).

From a theoretical perspective, next to a direct effect, also an indirect effect of pressure on CER is reasonable. Only a few studies have tested whether the influence of pressure is channelled by a third variable. Graafland and Smid (2017) hypothesised that perceived social licence pressure influences environmental performance not only directly but also through perceived market benefits. Cantele and Zardini (2020) tested the indirect effect between pressure on sustainability through benefits and barriers. Both studies show a significant mediated effect of pressure on sustainability through benefits. These studies, however, do not differentiate between internal and external pressure.

Based on the theories and literature, this study hypothesises that III) Perceived Benefits positively affect CER, IV) Perceived Barriers negatively affect CER, V) Perceived Internal Pressure indirectly affects CER through Perceived Benefits, VI) Perceived Internal Pressure indirectly affects CER through Perceived Barriers, VII) Perceived External Pressure indirectly affects CER through Perceived Benefits, and VIII) Perceived External Pressure indirectly affects CER through Perceived Barriers.

3 Data

The following section first explains how the sample was selected as well as how the survey was designed and distributed. The second part shows the sample composition, and the third describes the empirical design.

3.1 Sample Selection and Survey Design

This study focuses on SMEs with three to 249 full-time equivalent employees (FTE), in all industry sectors except finance and agriculture. Due to scarce available data, as part of the Enterprise Risk Management Report of the University of Applied Sciences of Lucerne and Kiel, an online survey with Swiss and German firms was conducted between mid-June and mid-September 2022.

The survey link was distributed to potential participants through various channels. Participants had the option to remain anonymous. First, 500 postal addresses provided by the Swiss Federal Statistical Office were used to send a printed survey invitation. A reminder was sent via email to 371 companies. Second, 158 different industry, trade, and craft associations were contacted, requesting them to disseminate the survey to their members. Associations not responding to the outreach were reminded after two weeks. Ten associations either sent the survey directly to their members or included the survey link in their newsletters, and 13 explicitly declined to distribute the survey. The remaining did not respond despite multiple attempts to contact them. Third, the email addresses of 1,815 companies in Switzerland and 557 in Germany (of all sizes, including 249+ FTE) were collected, and an invitation to participate was emailed. Lastly, the research team used the social network platform LinkedIn to share the survey link to increase the sample size. The link was shared by nine individuals among varying networks, industries, and geographical locations. Lastly, the survey link was distributed via the member network of the Risk Management Association in Germany. Attempting to increase the response rate, an additional random 700 SMEs were emailed in August 2022.

Correspondence was in German, English, Italian, or French, based on the company's operating region. The survey link led to a language-specific questionnaires. The response rate cannot be definitively determined, however in the 500-company sample it is 12 %. The survey distribution method may have elicited multiple responses from the same company; however, multiple measures were taken to ensure data consistency.

Based on the hypotheses, the survey was structured into six categories:

1. Corporate Environmental Responsibility,
2. perceived internal and external pressure,
3. perceived benefits,
4. perceived barriers, and
5. descriptive attributes of the individual company including capital structure.

The measurement items from part 1 to 4 were measured on a five-point Likert scale. The detailed questionnaire is in the appendix.

Although the sample size with n=173 is small, all industries are well-reflected in the sample, and the sample comprises all CER-levels. Therefore, the small sample size is not expected to meaningfully limit the interpretation of the analysis.

3.2 Summary Composition

Table 1 shows the sample composition of the collected dataset. Of all respondents, most CEOs are male (80.84 %), and most of the companies were founded before 1980 (40.10 %). The questionnaire was mainly answered in German, with the Swiss-specific

Table 1: The Sample Composition

Variable	Categories	N	share
CEO gender	Male	135	80.84 %
	Female	18	10.78 %
	Both, male and female	14	8.38 %
Industry	Commerce	25	14.45 %
	Manufacturing	16	9.25 %
	Construction	31	17.92 %
	Restaurants and Hotels	9	5.20 %
	Transportation, Information, Housing	55	31.79 %
	Education, Health	23	13.29 %
	Machinery, electrical and metal industry	10	5.78 %
	Other	4	2.31 %
Firm size	3–9 FTE	65	37.60 %
	10–49 FTE	65	37.60 %
	50–99 FTE	15	8.70 %
	100–249 FTE	28	16.20 %
Founding Year	Before 1980	69	40.10 %
	1980–1989	25	14.50 %
	1990–1999	25	14.50 %
	2000–2009	22	12.80 %
	2010–2019	24	14.00 %
	2020–2022	7	4.10 %
Language	German (Germany)	9	5.20 %
	Italian (Switzerland)	3	1.70 %
	French (Switzerland)	18	10.40 %
	German (Switzerland)	143	82.70 %
Business Model	Business-to-Business (B2B)	105	60.69 %
	Business-to-Consumer (B2C)	108	62.43 %
Family Equity	Yes	29	16.76 %
	No	144	83.23 %

After correcting for invalid responses, the final sample composes of 173 different SME, representing companies with different characteristics.

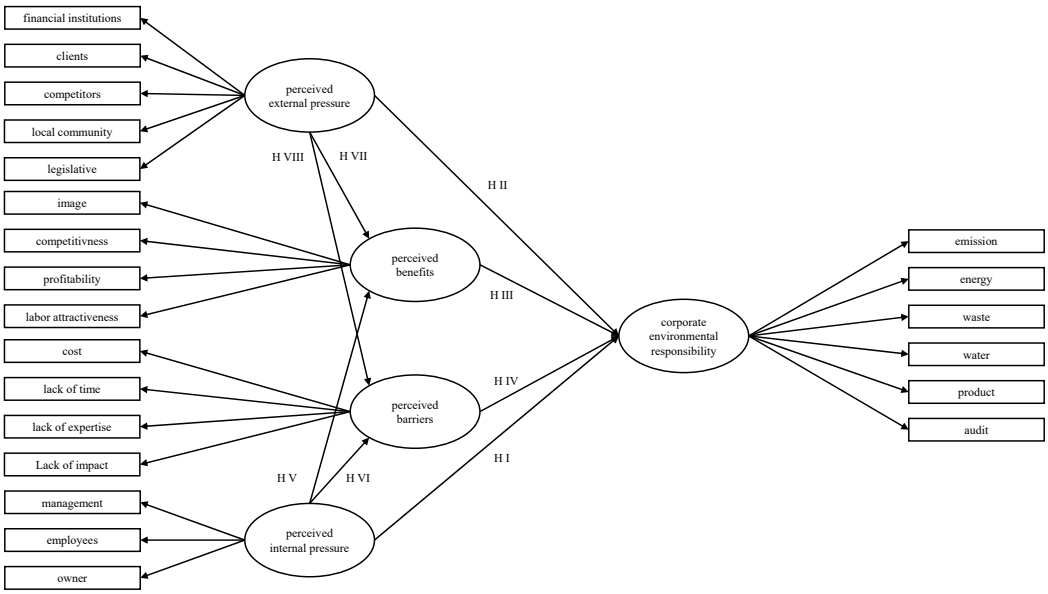
web link (82.70 %). Based on the languages selected by the recipients, the sample is primarily from Switzerland (94.80 %). The industry distribution in the final sample is close to the actual distribution of Swiss SMEs. In the sample, SMEs with 3–9 FTE are underrepresented, while those with 10 and more FTE are overrepresented.

To check for non-response bias, 28 variables were compared between early and late respondents. Out of these variables, the t-test (Student, 1908) and the chi-test (Pearson, 1900) revealed differences of only four variables at the 95 % confidence level. Considering the minor differences, non-response bias is unlikely to significantly affect the data.

3.3 Empirical Design

Before conducting regression analysis, the measurement validity and internal consistency of the five latent variables are assessed. This evaluation involves examining the composite reliability, Cronbach's alpha, and the results of Confirmatory Factor Analysis (CFA) for the measurement items. Subsequently, SEM is used to depict the hypotheses, and to estimate the model parameters best replicating the observed data. SEM is particularly useful to model relationships among multiple independent and dependent constructs simultaneously (Anderson & Gerbing, 1988; Weiber & Mühlhaus, 2014). Therefore, the model can also capture indirect effects. Figure 1 shows the graphical representation of the estimation model.

Figure 1: Graphical Representation of Hypothesised Relationships



The graphical representation shows model A. Latent variables are illustrated as circles and manifest variables as rectangles. The arrows represent the expected positive or negative relationship direction. Next to each arrow between the latent variables, the respective hypothesis is indicated. The figure omits error terms. Model B is equal but without the arrows of HV, HVI, and HVIII.

SEM has two main limitations: Common Method Bias (CMB) and multicollinearity. CMB occurs when response variations are due to the measurement instrument rather

than actual differences among respondents. To address this issue, this study designed the questions carefully, allowed for anonymous participation, conducted a pre-test, and used the Harman's Single Factor Test, resulting in 0.23, lower than the commonly used threshold of 0.50 (Williams & McGonagle, 2016). For multicollinearity, this study checked the correlation among all measured variables and found no strong correlation, resulting in all variance inflation factors below three. As such, it is not assumed that the presence of both CMB and multicollinearity will have a substantial impact on the outcome of this study.

The survey design allowed participants to voluntarily not answer specific questions, resulting in missing dataset values, which are assumed to be Missing at Random (MAR). Full Information Maximum Likelihood (FIML; Enders, 2001) is the recommended treatment method for MAR, using auxiliary variables to estimate the missing values. FIML has been shown to be superior to mean replacement or listwise deletion (Peyre et al., 2011).

The analysis used maximum likelihood (ML) estimators and employed bootstrapping as a robust approach, especially useful for small survey datasets, as it is less affected by outliers and violations of assumptions compared to traditional methods.

4 Results

The empirical results including descriptive statistics, regression results and robustness tests are summarized in this section.

4.1 Descriptive Results

Table 2 reports summary statistics for the measurement items of the latent variable. As expected, most estimators violate the normality assumption. The observation number varies among each variable, with the lowest answer rate of n=154. Due to the distribution process, self-section was possible. To address this, the study looked at the CER items and the average score distribution to see whether only organisations with a high interest in sustainability had participated in the survey. Given that the CER average scores are slightly negatively skewed (-0.28), in the sample there are only marginally more sustainable enterprises than non-sustainable enterprises. However, self-selection bias cannot be totally disregarded as the true distribution is unknown.

Based on the measurement items, the empirical validity of the distinction between Perceived Internal and External Pressure can be statistically confirmed through a principal component analysis (not tabulated). The result clearly indicates two distinct groups. Further, the correlations between all measurement items were checked. Only the correlation between management and owners is above 0.70 and significant, as well as lack of impact correlates with lack of expertise, but not with the other two items of Perceived Barriers. Additionally, the CFA results (not tabulated) suggest a high level of internal validity for the five constructs. Only the standardised estimate of lack of impact results low with a value of 0.12, and the standardised estimate of lack of time results high with a value of 0.93. Robustness tests addressing these findings are described in section 4.3. Theoretically and economically, both variables can be justified to be part of the construct and are therefore kept in the main model. The composite reliability of all latent variables ranges between 0.82 and 0.89 (see Table 3). The standardised covariances of the measurement model in Table 3 reveal a significant relation between all latent variables, except for the relations with the variable Perceived Barriers.

Table 2: Summary Statistics of Measurement Items

	N	Mean	SD	Min	p25	p50	p75	Max
CER								
Emissions	160	3.69	1.13	1	3	4	5	5
Energy	168	4.07	0.95	1	4	4	5	5
Waste	171	4.42	0.79	1	4	5	5	5
Water	165	3.53	1.08	1	3	4	4	5
Product	163	3.75	1.12	1	3	4	5	5
Audit	160	2.39	1.55	1	1	2	4	5
Perceived Barriers								
Cost	171	3.75	1.10	1	3	4	5	5
Lack of Expertise	165	3.11	1.14	1	2	3	4	5
Lack of Time	168	3.45	1.17	1	3	4	4	5
Lack of Impact	165	3.06	1.22	1	2	3	4	5
Perceived Benefits								
Competitive Advantage	168	3.36	1.10	1	3	4	4	5
Image Improvement	171	4.15	0.95	1	4	4	5	5
Labour Attractiveness	169	3.44	1.14	1	3	4	4	5
Profitability	166	3.08	1.13	1	2	3	4	5
Perceived External Pressure								
Clients	165	3.39	1.10	1	3	4	4	5
Competitors	163	2.82	1.18	1	2	3	4	5
Financial Institutions	154	2.29	1.10	1	1	2	3	5
Legislation	165	3.62	1.07	1	3	4	4	5
Local Community	161	3.04	1.23	1	2	3	4	5
Perceived Internal Pressure								
Management	165	3.70	1.25	1	3	4	5	5
Owners	157	3.27	1.40	1	2	4	4	5
Employees	171	3.41	1.11	1	3	4	4	5

For each latent variables, the summary statistics of its respective measurement items are calculated. The table shows the number of observations (n), the standard deviation (SD), the arithmetic mean (Mean), as well as the quartiles.

Table 3: Standardised Covariance between Latent Variables

Variables	1	2	3	4	5
1. Perceived Barriers	1.00				
2. Perceived Benefits	0.16	1.00			
3. Perceived Internal Pressure	-0.02	0.44***	1.00		
4. Perceived External Pressure	0.86	0.56***	0.63***	1.00	
5. CER	-0.08	0.61***	0.67***	0.53***	1.00
Composite Reliability	0.87	0.85	0.84	0.86	0.82

* $p<.10$; ** $p<.05$; *** $p<.01$

The standardised covariances between latent variables and its respective p-values are calculated with 5,000 bootstraps and FIML estimating missing data.

4.2 Regression Results

For the regression analysis the primary focus lies on model A, as illustrated in Figure 1. This model proposes an indirect effect of Perceived Internal and External Pressure on CER through Perceived Benefits and Perceived Barriers. Table 4 shows SEM analysis results, with columns marked (a) excluding control variables and columns marked (b) including firm size (FTE), CEO age, and business model (B2B) as control variables. The results highlight the significant link between Perceived Internal Pressure and CER (H I). Perceived Barriers's effect on CER is only significant, including control variables. The direct paths Perceived External Pressure on Perceived Benefits, as well as Perceived Benefits on CER (H III) are statistically significant, indicating the significant effect of Perceived External Pressure on the potential mediator Perceived Benefits, and the potential mediators' effect on CER. However, in model A, the Sobel Test (Sobel, 1982) cannot confirm any indirect effects (H V, H VI, H VII, and H VIII).

To delve into the Perceived External Pressure and CER relationship, a streamlined model B omits non-significant indirect paths. This reduces the risk of overfitting, increases the model's predictive accuracy, and consequently leads to a more parsimonious model. In model B, the Sobel Test (Sobel, 1982) confirms that an increase in Perceived External Pressure is associated with an indirect increase in CER through Perceived Benefits (H VII). Specifically, a 0.80-unit rise in the External Pressure-Perceived Benefits association yields a 0.25 CER increase.

Directly, with every unit, Perceived Benefits increases CER by 0.30 (H III), and Perceived Internal Pressure by 0.57 (H I). The direct links between Perceived External Pressure (H II), and Perceived Barriers' (H IV) with CER are not significant.

The Family Equity dummy variable (1=partly family-owned, 0=not family-owned) positively correlates with Perceived Pressure from Owners. Partly family-owned businesses perceive 0.52 (model A) and 0.53 (model B) units higher pressure from their owners. In model A, FTE 3–9 and B2B are significant, unlike model B with no significant control variables.

Both models fit well, with slight differences in BIC and AIC. Reproducing the models with ordinary least square (OLS) and equally weighted latent variables shows most relationships are significant, except the direct External Pressure-CER link and the indirect Internal Pressure-CER effect via Perceived Barriers in model A with control variables.

Although SEM and OLS regressions are mathematically equivalent (Iacobucci et al., 2007), as expected, divergent coefficients and *p*-values arise from latent variable measurement differences[3] and the smaller OLS sample size.

Table 4: SEM and OLS Regression Results with Fit Measures

Path	Model A			
	SEM		OLS	
	(a)	(b)	(a)	(b)
Perceived Internal Pressure → CER	**0.55***	**0.61****	**0.29*****	**0.31*****
	(0.31)	**(0.30)**	**(0.07)**	**(0.07)**
Perceived External Pressure → CER	0.01	0.06	0.14	0.14
	(0.30)	(0.23)	(0.10)	(0.10)
Perceived Benefits → CER	**0.30***	**0.26****	**0.36*****	**0.30*****
	(0.14)	**(0.13)**	**(0.09)**	**(0.09)**
Perceived Barriers → CER	-0.17	**-0.36***	**-0.19****	**-0.28*****
	(0.20)	**(0.19)**	**(0.08)**	**(0.08)**
Perceived External Pressure → Perceived Benefits	0.66	**0.64****	**0.31****	**0.29****
	(0.31)	**(0.24)**	**(0.12)**	**(0.11)**
Perceived Internal Pressure → Perceived Benefits	0.21	0.23	**0.21****	**0.22*****
	(0.29)	(0.25)	**(0.08)**	**(0.08)**
Perceived External Pressure → Perceived Barriers	0.20	0.18	**0.22****	**0.22****
	(0.20)	(0.16)	**(0.09)**	**(0.09)**
Perceived Internal Pressure → Perceived Barriers	-0.16	-0.14	**-0.14***	**-0.14***
	(0.17)	(0.14)	**(0.08)**	**(0.07)**
Perceived External Pressure → Perceived Benefits → CER	0.20	0.17	**0.11***	**0.09***
	(0.22)	(0.12)	**(0.06)**	**(0.04)**
Perceived Internal Pressure → Perceived Benefits → CER	0.06	0.06	**0.07****	**0.07****
	(0.14)	(0.08)	**(0.04)**	**(0.03)**
Perceived External Pressure → Perceived Barriers → CER	-0.04	-0.06	-0.04	**-0.06****
	(0.06)	(0.09)	(0.03)	**(0.03)**
Perceived Internal Pressure → Perceived Barriers → CER	0.03	0.05	0.03	**0.04***
	(0.05)	(0.07)	(0.02)	**(0.02)**
Familiy Equity → Owner Pressure	**0.52*****	**0.51*****		
	(0.17)	**(0.17)**		
FTE 3–9 → CER		**-0.19****		**-0.35*****
		(0.08)		**(0.06)**
FTE 10–49 → CER		0.04		-0.12
		(0.06)		(0.06)

3 For OLS, the constructs were measured by computing the equally weighted mean scores of the measurement items.

Path	Model A			
	SEM		OLS	
	(a)	(b)	(a)	(b)
FTE 50–99 → CER		0.06 (0.09)		-0.14 (0.09)
FTE 100–249 → CER		0.11 (0.09)		**-0.16*** **(0.06)**
CEO age → CER		-0.01 (0.00)		0.00 (0.00)
B2B → CER		**0.16**** **(0.07)**		**-0.18**** **(0.07)**
t-stat	475	626		
df	222	347		
BIC	10,546	10,203		
GIF	0.97	0.97		
RMSEA	0.08	0.07		
CFI	0.79	0.85		
SRMR	0.09	0.09		
R^2 of CER	0.59	0.64	0.46	0.51
n	173	173	138	136

* $p<.10$; ** $p<.05$; *** $p<.01$

The regression results (SEM and OLS) and its fit measures are obtained with 5,000 bootstraps, maximum likelihood estimators, and missing data estimated with FIML. The first column indicates the analysed relationship path, based on Figure 1. The columns marked (a) represent the regression results excluding control variables and columns marked (b) with control variables. The coefficients are (unstandardised) estimates and in parentheses the respective standard errors are given. Values achieving statistical significance at the 90 % confidence level are displayed in bold.

Table 4: SEM and OLS Regression Results with Fit Measures

Path	Model B			
	SEM		OLS	
	(a)	(b)	(a)	(b)
Perceived Internal Pressure → CER	**0.57* (0.29)**	**0.63**** **(0.31)**	**0.27*** **(0.07)**	**0.29*** **(0.07)**
Perceived External Pressure → CER	-0.01 (0.23)	0.03 (0.23)	0.14 (0.10)	0.13 (0.10)
Perceived Benefits → CER	**0.31**** **(0.13)**	**0.27**** **(0.13)**	**0.36*** **(0.09)**	**0.31*** **(0.09)**
Perceived Barriers → CER	-0.17 (0.29)	-0.33 (0.21)	**-0.19**** **(0.08)**	**-0.26*** **(0.08)**

Path	Model B			
	SEM		OLS	
	(a)	(b)	(a)	(b)
Perceived External Pressure → Perceived Benefits	**0.80*** (0.20)**	**0.78*** (0.19)**	**0.43*** (0.10)**	**0.41*** (0.10)**
Perceived External Pressure → Perceived Benefits → CER	**0.25* (0.13)**	**0.21* (0.12)**	**0.16*** (0.06)**	**0.13** (0.05)**
Familiy Equity → Owner Pressure	**0.53*** (0.17)**	**0.52*** (0.17)**		
FTE 3–9 → CER		-0.18 (0.14)		**-0.43*** (0.07)**
FTE 10–49 → CER		0.10 (0.14)		**-0.20*** (0.08)**
FTE 50–99 → CER		0.04 (0.17)		**-0.32*** (0.12)**
FTE 100–249 → CER		0.21 (0.15)		**-0.25*** (0.09)**
CEO age → CER		0.00 (0.01)		0.00 (0.00)
B2B → CER		0.08 (0.10)		**0.16** (0.08)**
t-stat	474	643		
df	221	348		
BIC	10,550	10,215		
GIF	0.97	0.97		
RMSEA	0.08	0.07		
CFI	0.79	0.84		
SRMR	0.09	0.09		
R^2 of CER	0.59	0.65	0.41	0.49
n	173	173	131	129

* $p<.10$; ** $p<.05$; *** $p<.01$

The regression results (SEM and OLS) and its fit measures are obtained with 5,000 bootstraps, maximum likelihood estimators, and missing data estimated with FIML. The first column indicates the analysed relationship path, based on Figure 1. The columns marked (a) represent the regression results excluding control variables and columns marked (b) with control variables. The coefficients are (unstandardised) estimates and in parentheses the respective standard errors are given. Values achieving statistical significance at the 90 % confidence level or higher are displayed in bold.

The models assume unidirectional relationships. To examine the plausibility of a bidirectional relationship, firms with high CER scores founded before 1989 were compared to those formed after 2010. The older the company, the better the stakeholder's capacity to observe the outcomes of environmental responsibility. Younger firms and its stakeholder may not yet be able to perceive the ramifications of high CER, as the effects of CER

are expected to manifest over time, given that stakeholders react to changes in CER, and benefits can accrue only after an increase in CER. The analysis does not show any differences between older and younger high-CER companies. Economically, it is unlikely that increasing (decreasing) CER reduces (increases) Perceived Barriers. However, ruling out the possibility of reverse causality is not entirely possible.

4.3 Robustness Tests

In addition to OLS regressions, multiple SEM analysis were conducted, using different latent variable measurements, based on the extreme values identified in the CFA mentioned in section 4.1. For model A and model B, three distinct computations were performed: excluding the measurement items Lack of Impact, Pressure from Owners, and Pressure from Management.

Excluding Lack of Impact results in similar coefficients (not tabulated). For model A, only the relationship Perceived External Pressure on Perceived Benefits remains significant and none of the relationships including Perceived Barriers become significant through the exclusion. In model B the same relationships remain significant, and all coefficients remain at the same level. Excluding either Pressure from Owners or Pressure from Management results in an underidentified partial model, due to only two measurement items of the variable. Nonetheless, the calculations were performed as the overall model remains identified. With model A, none of the relationships remain statistically significant. With model B, the results are similar as the main model described in section 0: The direct relationships between Perceived Benefits and CER, Perceived External Pressure and Perceived Benefits, and also the indirect relationship between Perceived External Pressure and CER through Perceived Benefits are statistically significant. When changing the measurement items of Perceived Internal Pressure, its direct relationship with CER is no longer statistically significant. Therefore, the robustness tests confirm most, but not all, findings of model B. Overall, model B proofs to be robust for most results, while model A does not.

5 Conclusion and Discussion

The findings of this study are particularly important for stakeholders such as policymakers or financial institutions. The findings demonstrate the power of internal stakeholders in driving impact material environmental actions in SMEs. Pressure from internal stakeholders can directly influence an SMEs' CER. This suggests that internal stakeholder pressure is effective even with no apparent economic, and therefore financial material benefit. In contrast, the results indicate that pressure from external stakeholder cannot influence CER directly, but potentially indirectly through perceived benefits. This implies that any initiative by external stakeholders to encourage an SMEs' environmental responsibility is effective only when associated with potential economic benefits.

Consistent with previous literature, in the sample, the influence of perceived barriers on CER is inconclusive, and can therefore not be confirmed. Furthermore, the analysis shows that family-owned businesses experience significantly more pressure from their owners to act environmentally responsible. This finding highlights the importance of long-term orientation in the field of CER.

Nevertheless, as this study is based on cross-sectional data, further research is needed to validate the results. An analysis over time with a changing environment is needed

to confirm a causal relationship. For instance, the COVID-19 pandemic has presented difficulties for many SMEs and the Ukrainian conflict, three months before the survey, increased energy prices. This may have altered how pressure, benefits, and barriers are perceived and how aware corporates are of CER.

Future research could explore different types of incentives to offer SMEs, such as government tax credits or subsidies, interest rate reduction from financial institutions, or higher prices from customers, to evaluate their effectiveness in promoting CER. To better understand the influence of internal stakeholders on CER, the channelling effect of perceived benefits for internal stakeholder should, in addition to economic benefits, also include ethically motivated benefits. Owner and lender structure of SMEs and its effect on CER also need to be researched further to understand the influence of different financial stakeholders. It is not clear whether the same results hold in other countries and cultures.

Appendix

Questionnaire

Note: The original survey contained additional questions, which are not relevant for this study. Therefore, the questions which are not relevant, are omitted and only the relevant questions for this study are displayed below. The complete questionnaire is available upon request.

ERM Report 2022 "Environment and Climate Risk"

The Lucerne University of Applied Sciences and Arts is conducting a study on the topic of "environmental and climate risks" in cooperation with the Kiel University of Applied Sciences. Recommendations for action for the development of risk management with regard to environmental and climate factors are being derived on the basis of the practical results. The results will also be scientifically evaluated as part of a doctoral thesis for the University of Neuchâtel.

Based on your valuable practical experience and knowledge, we kindly ask you to participate in the online survey and contribute to the success of this study. Please relate all answers to the company in which you currently work.

As a thank you for your participation, we will send you the analysed results by e-mail on request.

By "your company" we mean the company in which you currently work. If you cannot or do not want to answer a question. please use the selection "n/a".

How many people are currently employed by your company?
(in full time equivalents – FTE)
Variable "empl"

- o <= 2 employees
- o 3 to 9 employees
- o 10 to 49 employees
- o 50 to 99 employees
- o 100 to 249 employees
- o > 250 employees

By "your company" we mean the company in which you currently work. If you cannot or do not want to answer a question. please use the selection "n/a".

Please indicate to what extent you agree with the following statements regarding your company.

Variable	Question	strongly disagree	slightly disagree	neither agree nor disagree	slightly agree	strongly agree	n/a
		1	*2*	*3*	*4*	*5*	
emissions	My company adopts policies to reduce greenhouse gas emissions (CO2, methane, nitrous oxide, and fluorinated gases).	o	o	o	o	o	o
energy	My company adopts policies to improve its energy efficiency.	o	o	o	o	o	o
water	My company adopts policies to improve its water efficiency.	o	o	o	o	o	o
waste	My company adopts policies to recycle, reduce, reuse, substitute, treat, or phase out total waste.	o	o	o	o	o	o
product	My company adopts policies to produce, sell and promote environmental-friendly products and / or services.	o	o	o	o	o	o
audit	My company works with external parties to audit and rate the companies' environmental responsibility (ex. ISO 14000, Sustainability Rating Agencies, ...).	o	o	o	o	o	o

Please assess the following drivers (perceived pressures, benefits, and barriers) for your Corporate Environmental Responsibility.
We perceive pressure from the following parties on our Corporate Environmental Responsibility:

Variable	Question	strongly disagree	slightly disagree	neither agree nor disagree	slightly agree	strongly agree	n/a
		1	*2*	*3*	*4*	*5*	
owners	Company Owners	o	o	o	o	o	o
management	Management	o	o	o	o	o	o
employees	Employee	o	o	o	o	o	o
-	Company Board (if applicable)	o	o	o	o	o	o
legislation	Legislation	o	o	o	o	o	o
clients	Clients	o	o	o	o	o	o
financial institutions	Financial Institutions (banks and insurances)	o	o	o	o	o	o
competitors	Competitor	o	o	o	o	o	o
-	Supplier	o	o	o	o	o	o
-	Audit	o	o	o	o	o	o
-	Media	o	o	o	o	o	o
local community	Local community	o	o	o	o	o	o
-	NGO and NPOs	o	o	o	o	o	o
-	Other parties from which we perceive pressure: _____	o	o	o	o	o	o

We perceive pressure from the following benefits for us through our Corporate Environmental Responsibility:

Variable	Question	strongly disagree	slightly disagree	neither agree nor disagree	slightly agree	strongly agree	n/a
		1	*2*	*3*	*4*	*5*	
image improvement	Image improvement	o	o	o	o	o	o
profitability	Profitability improvement	o	o	o	o	o	o
labor attractiveness	Labor market attractiveness improvement	o	o	o	o	o	o

competitive advantage	Competitiveness improvement	o	o	o	o	o	o
-	Other benefits that we perceive: _____	o	o	o	o	o	o

We perceive pressure from the following barriers for us through our Corporate Environmental Responsibility:

Variable	Question	strongly disagree	slightly disagree	neither agree nor disagree	slightly agree	strongly agree	n/a
		1	*2*	*3*	*4*	*5*	
cost	Too high costs	o	o	o	o	o	o
lack of time	Lack of time	o	o	o	o	o	o
lack of expertise	Lack of expertise	o	o	o	o	o	o
lack of impact	Too little corporate impact on the environment	o	o	o	o	o	o
-	Other barriers that we perceive: _____	o	o	o	o	o	o

In which industry is the company predominantly operating?
variable industry

- o Commerce: Maintenance and repair of motor vehicles
- o Manufacturing (Mining & quarrying; manufacuring and production of goods; electricity, gas, steam & air conditioning supply and water supply & severage & waste management)
- o Construction
- o Restaurant and hotels
- o Transportation & storage; information & communication, real estate & housing; freelance, scientific & technical services and other business services
- o Education; health & social work; arts, entertainment & recreation; other service activities
- o Machinery, electrical and metal industry
- o Financial industry
- o Other: _____

The company sells its products or services … Multiple answers possible

B2C o Direct to consumers (B2C).

B2B o To other companies (B2B).

o n/a

In which function in the company are you currently working?

_____

Which gender does the managing director belong to?
variable CEO_gender

o Female

o Male

o diverse

o n/a

How old is he current CEO? In case of job sharing, please specify the average.
variable CEO_age

_____

In which year was your company founded?
variable founding_year

o Before 1980

o 1980 – 1989

o 1990 – 1999

o 2000 – 2009

o 2010 – 2019

o 2020 – 2022

o n/a

As of the end of your fiscal year in calendar year 2019 (pre Covid-19) the last fiscal year
Sum must add up to 100 %

Equity from the management	_____
Equity from employees (who are not part of the management	_____
Equity from the government	_____
Equity from family members	_____
Equity from other parties	_____
State Covid-19-Loan	_____
Other Loans from the Government (excl. Covid-19-Loan)	_____
Mortgage Loans from Financial Institutions	_____
Other Loans from Financial Institutions (excl. mortgage loans)	_____
Loans from families, friends, shareholders or partner companies	_____
Loans from Suppliers	_____
Loans from other sources	_____

Thank you very much for your participation. The results of the survey will be published on Thursday, 10 November 2022 as part of the Enterprise Risk Summit 2022. As a thank you for your participation in the survey, we will be happy to send you the final study with the results directly to your inbox. You are welcome to leave your e-mail address for this purpose. The e-mail address will only be used for this purpose and will be deleted afterwards.

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