

# Perceived enablers and barriers impacting sustainability of small-and-medium sized enterprises: A quantitative analysis in four European countries

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## Abstract

Small and medium-sized enterprises (SMEs) often lag behind major corporations in implementing sustainability management practices, limiting their capacity to mitigate negative social and environmental impacts. A notable challenge is the lower percentage of SMEs with sustainability objectives. This research aims to examine the links among sustainability practices and performance of European SMEs. In addition, the causal relationships between enablers/barriers for sustainability practices are also examined. To achieve these objectives, a quantitative research approach was employed. Data were collected from 420 SMEs located in the United Kingdom, France, Spain, and Greece using a structured questionnaire. Statistical modeling and inference were used to analyze the responses, separately for each of the four countries. The study revealed several significant findings. Strong relationships were identified between enablers/barriers and sustainability practices. The study found consistent links between supply chain sustainability practices and SME performance across all participating countries. The research highlighted similarities and differences in findings across various economies and geographical regions. The study's findings have important implications; For policymakers insights from this research can inform policy decisions aimed at promoting sustainability among SMEs, thus contributing to broader social and environmental goals. For SME owners and managers the findings offer guidance for improving sustainable performance through operational, planning, and strategic decisions. Policymakers should consider initiatives that encourage SMEs to adopt sustainability practices. SME owners and managers should prioritize supply chain sustainability and work on overcoming barriers identified in this study. Further research should explore specific strategies for enhancing sustainability practices in different regions and economies.

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**KEYWORDS**

barriers, economic, enablers, environmental, Europe, performance aspects, practices, SMEs, social, sustainability

## 1 | INTRODUCTION—LITERATURE REVIEW

Achieving sustainability is a key issue for companies around the world. Company sustainability, often referred to as corporate sustainability or business sustainability, is a formal concept that encompasses the integration of economic, environmental, social, and ethical considerations into a company's operations and strategies to ensure its long-term viability and positive impact on society and the environment (Rodríguez-Espindola et al., 2022). It is the commitment of a company to balance profitability with responsible practices that contribute to the well-being of society and the preservation of natural resources (Carroll & Shabana, 2010). With focus on sustainability, companies are entitled to create value for sustainability, business and society as an integrated part of their strategy (Rendtorff, 2019). More recently, the evolution of sustainability and corporate social responsibility (CSR) concepts in the context of Sustainable Development Goals (SDGs) has revitalized the global commitment for businesses and organizations to contribute to positive societal and environmental issues (Rendtorff, 2019).

Nowadays, sustainability and sustainable business models are intricately linked concepts in today's global landscape. Sustainability refers to the responsible use of resources and practices that minimize environmental impact while meeting the needs of the present without compromising the future. Sustainable business models, on the other hand, are strategic approaches adopted by companies to integrate sustainability principles into their operations, products, and services. These models enable a transformation of capitalist economies towards a more ecologically oriented solidarity economics (Rendtorff, 2019).

There is a growing literature that analyzes the relationship between the economy, society, and the environment (e.g., Dey, Malesios, et al., 2018; Jones et al., 2009). Firms improve their consistent behavior from several sources, for example, regulations, consumers and stakeholders (Dey & Cheffi, 2013). With increasing social responsibility for procurement and increasing pressure from stakeholders (mainly customers, regulators, NGOs, and the media), many companies are actively pursuing sustainability management within their organizations and suppliers.

SMEs face difficulties trying to achieve green supply chains, waste reduction, and low-carbon development because they have less experience in environmental management and lower productivity than large enterprises, thus reducing their impact on the environment. SMEs prioritize economic performance over environmental and social to remain competitive (Malesios et al., 2021). This is due to several reasons, such as limited financial and management resources and lack of time and skills to implement sustainability practices (Sullivan-Taylor & Branicki, 2011). In addition, small businesses tend to focus on short-term planning, emergency response and survival (Hudson-Smith & Smith, 2007). Similarly, SMEs share a less formal structure, codified policies and are largely managed by the owner (see e.g., Ates et al., 2013). On the other

hand, and despite the drawbacks of SMEs, as discussed before, recent researches also focus on the competitive advantages of SMEs in the terms of adaption of sustainable techniques. Highlighting on the role of Eco-innovation, SMEs have advantages, such as being more flexible and Eco innovation-oriented than larger companies (see Mady et al., 2023).

### 1.1 | Enablers for sustainability

Enablers for pushing SMEs to adopt sustainability practices have been characterized as crucial in the relevant literature (see, e.g., Studer et al., 2006; Yadav et al., 2018). For example, the government is considered a very important external factor that has an influence on the behavior of SMEs via approved regulatory, legal, economical and structural support as well as dissemination of knowledge (Yadav et al., 2018). Another way to increase the sustainability of small businesses through government action is to provide various incentives concerning subsidies, a loan or an alternative economic benefit (Gandhi et al., 2018; Revell et al., 2009). Customer demand is another important factor that drives SMEs to perform sustainable practices within business management. This is achieved mainly through demanding green products as well as green processes (see, e.g., Battisti & Perry, 2011; Studer et al., 2006). Another initiative for driving sustainability of SMEs through customers has been reported to be the request by customers for various certificates, for instance ISO 14001, EMAS (Dey, Malesios, et al., 2018; Gadenne et al., 2009). The contribution of ISO 14001 and EMS as drivers for sustainability are mentioned also by other authors. The reported benefits of ISO 14001 concern improved Environmental Management System and process efficiencies leading to cost reductions and minimization of environmental impacts and associated risks, that in turn, contribute to increased organizational performance (Fonseca & Domingues, 2018; Murmura et al., 2018) and, in the long run, foster profitability and market benefits (Lee et al., 2017).

Competitors and their behavior is another factor that potentially affects SMEs and drives them to adopt sustainability management practices, as suggested in the relevant literature (see, e.g., Lee & Klassen, 2008). Environmental activities informing policy makers, public and customers for SMEs' environmental performance, is also another way of pressure for sustainability practices implementation (Battaglia et al., 2014). Research has been also focused into external drivers in order to adopt energy efficiency measures and subsequently achieve sustainable performance (Cagno & Trianni, 2013; Dey et al., 2020; Malesios et al., 2021).

### 1.2 | Barriers for sustainability

SMEs face a variety of barriers that negatively influence their ability to promote sustainable development practices, many of which are

not present or significant for large enterprises (Pinget et al., 2015). According to Tsalis et al. (2013), the implementation of sustainability systems and tools implies barriers that are particular to SMEs. Among these internal and external barriers, the lack of time for developing and implementing sustainability practices is proved to be a major factor (Revell & Blackburn, 2007; Revell et al., 2009).

## *SMEs face a variety of barriers that negatively influence their ability to promote sustainable development practices, many of which are not present or significant for large enterprises*

In a recent review on the barriers encountered by SMEs, the authors identified in the literature that the most common barriers are lack of resources and expertise, as well as high initial capital expenditures to measure sustainability (Álvarez Jaramillo et al., 2019). Tsalis et al. (2013) find that the most frequent barriers in SMEs are the limited economical resources and poor organizational structure. Ghazilla et al. (2015) conducted research on the barriers for green manufacturing practices in SMEs of Malaysia. According to them, the main obstacles are poor organizational structure to support implementation of sustainability and absence of research and development in SMEs. Ghadge et al. (2017) conducted a study of environmental barriers for the Greek dairy supply chain to identify five barriers for adopting ecological practices within real sector. These include a weak market structure, the lack of adequate logistics infrastructure, untapped environmental legislation, the need for warehousing and distribution processes and the disorganized management of returns.

It can be clear from the above literature review that Internal and External Enablers and Barriers for Sustainability have been widely discussed in the current bibliography. However, the major gap which can be pinpointed in the existing literature, is the lack of a holistic conceptual analysis of those Enablers and Barriers as combined measures/structures. The aim of this study is to analyze Enablers and Barriers not separately but as a whole combination, by constructing well defined and measured groups and factors, using advanced analytical techniques. Moreover, this study will be focused on all economic sectors of SMEs, since so far, many studies were only limited to Enablers and Barriers for specific sectors of SMEs.

### 1.3 | Objectives—Research questions

Recent studies found that supply chain sustainability is a major factor for organization competitiveness. However, limited studies have objec-

tively examined the relationships between sustainability practices and performance structures using a quantitative approach, utilizing statistical modeling and inference. To date, no in-depth study measuring the impact of SME supply chain management practices on performance has been conducted, with few exceptions (see Abdul-Rashid, Sakundarini, Ghazilla, et al., 2017; Malesios, Skouloudis, et al., 2018; Raza et al., 2021). There are also few studies, examining from a quantitative perspective, links between specific items of sustainability practices and performance, mainly sustainability practices items and their association to financial performance (e.g., Alshehhi et al., 2018; D'Agostini et al., 2017; Habidin et al., 2016; Larrán Jorge et al., 2015; Pham et al., 2021; Rahi et al., 2022). Research on sustainability in supply chains for SMEs is very limited, especially for linking practices in sustainable supply chains and performance of SMEs with external and internal enablers and barriers to sustainability management.

The study aims to address this gap and aims to make SMEs' business sustainable through better understanding of the causal relationships between European SMEs' supply chain sustainability practices and performance and their interrelations. It employs a more holistic approach on this subject, and investigates associations between the complete set of potential supply chain practices and performance for sustainability for SMEs, based on a theoretical well-specified selection of most important constructs for SMEs' supply chain sustainability (economic, environmental, and social). In addition, the causal relationships between enablers/barriers for sustainability practices are also examined.

This research specifically addresses the upcoming research questions:

**RQ1:** What are the most prominent between underlying enablers and barriers that stimulate the implementation of sustainability practices? What is the relative importance of these two constructs?

**RQ2:** Are there any causal relationships among the constructs and sub-constructs of sustainability in SMEs? Do these relationships vary due to the reasons associated with geographical, social or economic characteristics (e.g., developed/developing countries)?

**RQ3:** What needs to be done in order to improve SMEs' sustainable supply chain performance?

The contents of paper are the following. Introduction describes some basic concepts and definitions, as well as the objectives and research questions of the article. In Section 2, the material, the data collection methodology, some descriptive results, the conceptual structural equation modeling and the research hypotheses. In Section 3, detailed outcomes of the analysis, concerning quality and results of SEM. Finally in Section 4, discussion and summary of the whole work and conclusions about the current but also future investigation.

## 2 | MATERIAL AND METHODS

### 2.1 | Data collection and descriptive results

The target population of the study is SMEs from all European countries. Four countries (United Kingdom, France, Spain, and

Greece) were selected in order to take into account the significant economical and geographical diversions of the operation of SMEs. All economic/industry sectors are of interest for the study, however emphasis was given to sectors with significant “environmental footprint,” such as manufacturing, construction etc. Responders of the study were planned to be the SMEs’ managers, directors, or owner (or a combination of them) in order to quantify their perceived views regarding their company’s sustainability practices and performance.

## *The study uses a quantitative survey method using a structured questionnaire and an online survey tool*

The study uses a quantitative survey method using a structured questionnaire and an online survey tool. Data was collected using the questionnaire protocol. Prior to the final study, a variety of essential proactive actions were performed, in order to ensure the quality and reliability of survey data, in terms of validity and respondent and non-respondent bias assessment. These actions can be summarized to the following:

- **Experts reviews** of the survey to ensure that the questions are clear, relevant, and appropriate for the research objectives
- **Pilot testing** of the questionnaire to a small group of respondents in all countries, to identify any potential issues with question wording, response options, language, terminology, misclarification of questions, etc.
- **Translation and Back-Translation** of the questionnaire, since the study is administered in different countries/languages, in order to ensure accuracy
- **Selection Bias Assessment** in order to compare the characteristics of survey respondents (SMEs) to those of the target population. In this comparison, a targeted “selection boost” in specific sectors, as described previously, can be considered aligned to the focus of the study
- **Mixed-Methods Approach** combining questionnaires with qualitative methods, such as interviews with the responders, to gain a deeper understanding and triangulate findings. This action also includes a very limited number of interviews with SMEs who did not respond to the initial survey. This can help identify reasons for non-response and assess whether non-respondents have different characteristics or opinions compared to respondents. According to these limited interviews, no systematic pattern of non-respondents was detected, however it should be taken into account that the number of interviews was limited and no further actions were taken

An on-line survey platform ([www.qualtrics.com](http://www.qualtrics.com)) was used for the survey. All responses were anonymous. Quotas were utilized to achieve representative geographical distribution of SMEs for every examined

country. The full questionnaire, as well as further details of the survey, are available upon request to the authors.

The final study concluded by collecting data from a total of 420 European SMEs (United Kingdom 103, France 93, Spain 100, Greece 124 SMEs). The distribution of the SMEs sector among the countries is presented in Exhibit 1. As expected, the majority of SMEs are from manufacturing sector (43.8%), with the exception of Greece (only 13.7% in this sector). This finding can be explained by the general nature of the SMEs in this country (less Manufacturing—more Services/Consulting SMEs), however it should be taken into account in the analysis.

As shown in Exhibit 2, the majority of SMEs are very small SMEs with 0–10 employees (37.1%), however 25% have 101–250 employees. Some noticeable diversions appear between countries (i.e., 47.6% of Greek SMEs have 101–250 employees).

In terms of the profile of the respondents of the survey within SMEs (Exhibit 3), it can be mentioned that all respondents are people in charge within the company (GM, CEO, owner), therefore, the initial planning of the survey was performed successfully. The relatively large proportion (11.3%) of “full time employee” in Greek SMEs refers to specific department managers (Financial, Marketing, and Engineering), so the quality and relevance of the produced results was not affected.

## **2.2 | Conceptual model for sustainable supply chain practices and performance—Research hypotheses**

The conceptual model for sustainable supply chain practices and performance proposed in the study is examined via a structural equation modeling approach (Bollen, 1989). The SEM approach is widely used for analyzing similar structures and datasets for SMEs but also for other sectors or industries (see for instance Rafindadi & Olanrewaju, 2019). The model was developed after reviewing relevant literature for all aspects of SMEs supply chain sustainability. These aspects are encapsulated in the four latent constructs of the environmental, economic, social, and organizational performance dimensions, which in turn are assumed to be directly influenced by the corresponding practices. Also, the constructs of enablers/barriers are examined, in terms of how they affect the corresponding practices. Every latent construct of all analyses arise from the indicator variables produced by the responses of online survey questionnaires collected by the SMEs’ managers (Tables A1 and A2 in the Annex). To ensure high validity for our obtained results, we measured each latent structure based on the previous literature and using several indicators (Tables A1 and A2). Our theoretical model is summarized in Exhibit 4.

The following hypotheses derive from the proposed model and prior research:

Prior research has proposed that the enablers can play a significant role for enhancing sustainability in SMEs (Cambra-Fierro & Ruiz-Benitez, 2011; Studer et al., 2006). Accordingly, we formulate hypotheses H1–H3:

**EXHIBIT 1** Distribution of SMEs by sector.

Sector	Country									
	Spain		France		UK		Greece		Total	
	N	%	N	%	N	%	N	%	N	%
Manufacturing	57	57.0%	50	53.8%	60	58.3%	17	13.7%	184	43.8%
Financial services	6	6.0%	4	4.3%	4	3.9%	12	9.7%	26	6.2%
Other services including IT and consultancy	17	17.0%	13	14.0%	11	10.7%	26	21.0%	67	16.0%
Construction, contracting and building management	7	7.0%	4	4.3%	8	7.8%	9	7.3%	28	6.7%
Energy	1	1.0%	4	4.3%	2	1.9%	8	6.5%	15	3.6%
Logistics and transportation	2	2.0%	3	3.2%	0	0.0%	9	7.3%	14	3.3%
Leisure, hotels and restaurants	3	3.0%	4	4.3%	4	3.9%	8	6.5%	19	4.5%
Education	2	2.0%	5	5.4%	3	2.9%	14	11.3%	24	5.7%
Medical and pharmaceutical	1	1.0%	4	4.3%	3	2.9%	10	8.1%	18	4.3%
Environmental Management	1	1.0%	1	1.1%	1	1.0%	3	2.4%	6	1.4%
Trading	3	3.0%	1	1.1%	7	6.8%	8	6.5%	19	4.5%
Total	100	100.0%	93	100.0%	103	100.0%	124	100.0%	420	100.0%

**EXHIBIT 2** Distribution of SMEs by size (number of employees).

No of employees	Country									
	Spain		France		UK		Greece		Total	
	N	%	N	%	N	%	N	%	N	%
0-10	40	40.0%	44	47.3%	23	22.3%	49	39.5%	156	37.1%
11-50	28	28.0%	11	11.8%	42	40.8%	0	0.0%	81	19.3%
51-100	25	25.0%	15	16.1%	22	21.4%	16	12.9%	78	18.6%
101-250	7	7.0%	23	24.7%	16	15.5%	59	47.6%	105	25.0%
Total	100	100.0%	93	100.0%	103	100.0%	124	100.0%	420	100.0%

**Hypotheses 1–3:** Enablers) of SMEs' supply chain sustainability implementation affect positively the three sub-constructs of sustainability practices (Environmental, Economic, Social).

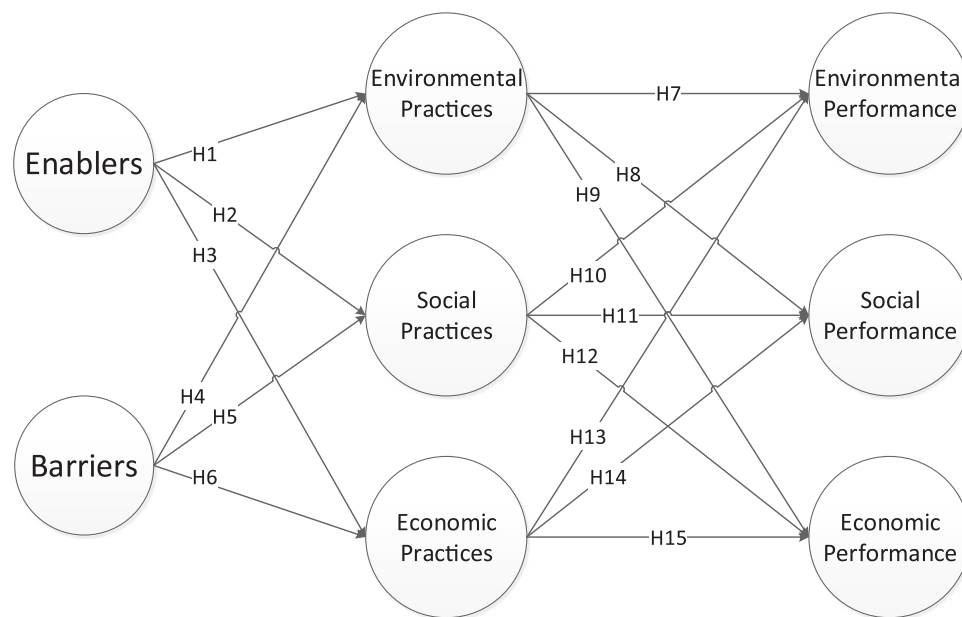
Similarly, internal and external barriers, that focus mainly on the employees of SMEs and the organizational culture of the company, can be a driving force for sustainability practices implementation (see, e.g., Ghadge et al., 2017; Masurel, 2017; Moursellas et al., 2023). This leads us to formulate the following hypotheses H4–H6:

**Hypotheses 4–6:** Barriers of SMEs' supply chain sustainability implementation affect positively the sustainability practices (Environmental, Economic, Social).

Additionally, we hypothesize that the constructs of sustainability practices are key factors of sustainability supply chain of SMEs. Recent research has shown a growing recognition of the positive link between sustainability practices and the sustainability performance of SMEs. Studies such as Jenkins and Yakovleva (2006) have highlighted that integrating sustainable practices, such as reducing energy consumption and waste, can lead to cost savings and enhanced environmental performance for SMEs. Furthermore, research by Malesios, Skouloudis et al. (2018) suggests that adopting sustainability practices can improve SMEs' financial performance. Moreover, it has been observed that SMEs engaging in social responsibility initiatives, as discussed in Vuong and Bui (2023), often experience increased customer loyalty and improved brand reputation. These findings underscore

**EXHIBIT 3** Distribution of respondents by position/role in SMEs.

Position/Role	Country									
	Spain		France		UK		Greece		Total	
	N	%	N	%	N	%	N	%	N	%
CEO	10	10.0%	7	7.5%	7	6.8%	11	8.9%	35	8.3%
General Manager	21	21.0%	21	22.6%	42	40.8%	26	21.0%	110	26.2%
Director	30	30.0%	18	19.4%	18	17.5%	24	19.4%	90	21.4%
Owner	31	31.0%	33	35.5%	32	31.1%	35	28.2%	131	31.2%
President	6	6.0%	14	15.1%	1	1.0%	10	8.1%	31	7.4%
Vice President	2	2.0%	0	0.0%	3	2.9%	1	0.8%	6	1.4%
Full time employee	0	0.0%	0	0.0%	0	0.0%	14	11.3%	14	3.3%
Other	0	0.0%	0	0.0%	0	0.0%	3	2.4%	3	0.7%
Total	100	100.0%	93	100.0%	103	100.0%	124	100.0%	420	100.0%

**EXHIBIT 4** Model structure and hypotheses.

the multifaceted benefits of sustainability practices for SMEs, including economic, environmental, and social advantages, which ultimately contribute to their long-term success in an increasingly sustainability-conscious market.

Hence, to test this central role of the connection between sustainability practices and performance of SMEs, we pose the hypotheses that all the sustainability practices contribute to superior sustainability performance. Consequently, our remaining hypotheses are:

**Hypotheses 7–9:** Environmental Practices are related to the economic, environmental, and social performance dimensions.

**Hypotheses 10–12:** Social Practices are related to the economic, environmental, and social performance dimensions.

**Hypotheses 13–15:** Economic Practices are related to the economic, environmental, and social performance dimensions.

A final research question is related to the potential variation in verifying the previous hypotheses due to country-specific regional characteristics. This research question is based upon previous research, for example, on Neri et al. (2021) where the authors highlight the influence of country factor among others on the perception of barriers and drivers of sustainability in SMEs. Therefore, in the end, the following hypothesis is proposed:

**Hypothesis 16:** Relationships between the constructs and sub-constructs for SMEs' supply chain sustainability vary due

**EXHIBIT 5** Reliability and validity measures for factors.

Factor	Country							
	Spain		France		UK		Greece	
	Cronbach's $\alpha$	% of explained variance	Cronbach's $\alpha$	% of explained variance	Cronbach's $\alpha$	% of explained variance	Cronbach's $\alpha$	% of explained variance
Enablers	0.940	67.48	0.934	65.91	0.884	52.10	0.902	56.39
Barriers	0.913	69.99	0.893	65.35	0.850	57.51	0.856	58.16
Economic Practices	0.918	67.27	0.897	62.11	0.831	50.07	0.894	61.53
Environmental Practices	0.955	65.49	0.953	63.85	0.935	56.41	0.959	67.39
Social Practices	0.942	68.23	0.946	69.98	0.923	62.55	0.958	74.93
Economic Performance	0.622	56.42	0.591	57.11	0.401	48.99	0.524	48.29
Environmental Performance	0.857	77.84	0.812	72.71	0.856	77.81	0.884	81.17
Social Performance	0.762	52.63	0.637	56.31	0.565	47.13	0.486	50.87

**EXHIBIT 6** Goodness-of-fit statistics for the four SEM models.

Country	GoF measures			
	RMR	GFI	AGFI	PGFI
Spain	0.11	0.963	0.961	0.904
France	0.138	0.959	0.928	0.898
UK	0.136	0.941	0.937	0.884
Greece	0.096	0.973	0.971	0.913

to reasons associated with geographical, social or economic characteristics.

### 2.3 | Structural equation modeling

The above-stated research hypotheses (1–16) are tested through the collected survey data of SMEs of the four European countries using structural equation modeling (SEM) (Bollen, 1989). The estimation of SEM models was performed using AMOS software (Arbuckle, 2006).

We fit a SEM model for each country (the United Kingdom, France, Spain, and Greece) to examine the direct connections among the enablers and barriers factors and the latent constructs of economic, environmental, and social practices, but also the associations of the latter with the corresponding performance factors.

Prior to fit the SEM models, reliability and validity of the latent factors is checked in order to derive robust estimates. For testing reliability the Cronbach's alpha has been utilized. Generally, a reliable value has to exceed 0.6. The convergent validity has also been tested through the calculations of percentage of total variance explained by the factors. Generally, a value above 50% is an adequate percentage to ensure validity in the analysis.

The SEM models' fit has been considered in each step of the analysis. The study considers standard goodness-of-fit measures, suitable

for SEM. Specifically, we used the Goodness-of-Fit index (GFI), the Parsimony Goodness-of-Fit Index (PGFI), the Adjusted Goodness-of-Fit index (AGFI) and the Root Mean Square Residual (RMR). Generally, GFI, PGFI, and AGFI have to be close to 1, and RMR has to be <0.1.

All variables of the online survey used to construct the latent factors of SMEs' practices and performance can be found in Table A1 in the Annex. Also, the description of the observed items referring to enablers and barriers is given in Table A2. Totally, 55 variables were used, most of which were measured on an ordinal scale and added to the appropriate latent factors.

## 3 | RESULTS

### 3.1 | Testing validity—reliability of the latent factors

All factors used in the analysis, as well as the calculated measures for checking validity and reliability of any constructed factor for the hypothesized model, are given below (Exhibit 5).

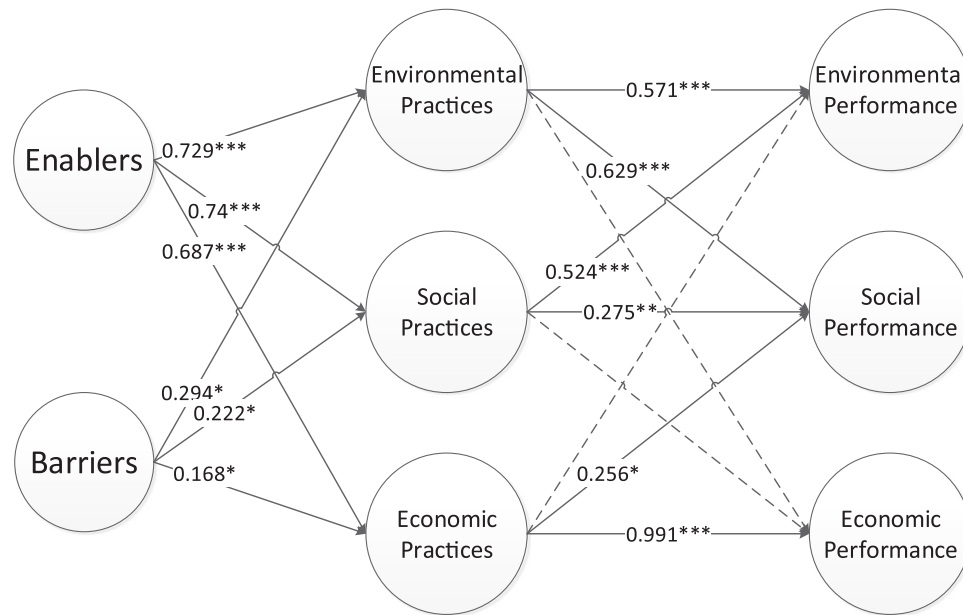
The results in Exhibit 5 show that the factors satisfactorily meet the reliability and validity requirements so all latent constructs are suitable for further analysis through SEM modeling.

### 3.2 | SEM results

#### 3.2.1 | Checking goodness-of-fit

Goodness-of-Fit (GoF) measures reveal satisfactory fits for all models, considering that all measured values exceed or approach the desired values (Exhibit 6).

The best results appear for Greek SMEs, with GFI, AGFI and PGFI indices being above 0.9 and the RMR being below 0.1.



**EXHIBIT 7** SEM results for the Spanish SMEs (— non-statistically significant association). (\*) 10% level of significance; (\*\*) 5% level of significance; (\*\*\*) 1% level of significance.

### 3.2.2 | Estimated parameters

To examine the effect of enablers and barriers on economic, environmental and social practices of sustainability and the effect of the latter on the corresponding performance, a separate SEM analysis for British, French, Spanish and Greek SMEs was applied. By doing so, probable similarities but also geographical diversifications among countries were identified.

Exhibits 7–10 present the path diagrams for each country after fitting each SEM model. Each one-way arrow indicates the direction of the expected causal relationship. Each value indicates the standardized regression weight of each of the latent constructs. The stars indicate if weights are statistically significant. Accordingly, a dotted line implies a non-statistically significant association.

As expected, the various factors of practices affect mainly the corresponding performance dimensions. However, there are additional important links between practices and different dimensions of performance. Moreover, examination of each SEM model reveals remarkable differences concerning the outcomes of the corresponding estimates.

According to the SEM of Spanish SMEs, Enablers factor affect significantly all constructs of sustainability practices. Enablers positively affect the Environmental Practices ( $\beta = 0.729, p < 0.01$ ), the Economic Practices ( $\beta = 0.687, p < 0.01$ ), and the Social Practices ( $\beta = 0.74, p < 0.01$ ). Barriers also have a positive effect on the three constructs, however this effect is less important when compared to the Enablers. Indeed, statistically significant associations are found Barriers and Environmental Practices ( $\beta = 0.294, p < 0.1$ ), Barriers and Social Practices ( $\beta = 0.222, p < 0.1$ ), and Barriers and Economic Practices ( $\beta = 0.168, p < 0.1$ ).

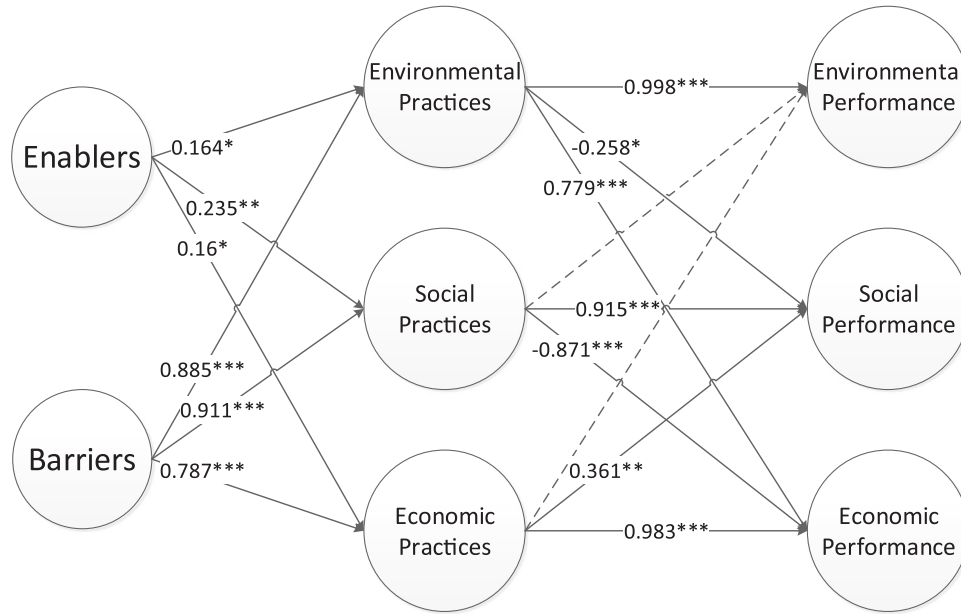
When we examine the associations among the three constructs of sustainability practices and corresponding performance we find a high positive association among Economic Practices and Economic Performance ( $\beta = 0.991, p < 0.01$ ), Environmental Practices and Environmental Performance ( $\beta = 0.571, p < 0.01$ ), Social Practices and Environmental Performance ( $\beta = 0.524, p < 0.01$ ), and Environmental Practices and Social Performance ( $\beta = 0.629, p < 0.01$ ). There are also statistically significant associations between Social Practices and Social Performance and Economic Practices and Social Performance.

Differing characteristics appear when observing the results of French SMEs (Exhibit 8). The SEM results utilizing the French SMEs' data are the most distinguishable among the comparable models. Here, the Barrier construct seems to be more important in comparison to the Enablers when observing the estimated parameters. Barriers construct is highly associated with all three sub-constructs at 1% significance level. However, Enablers are moderately associated with Environmental, Social and Economic Practices.

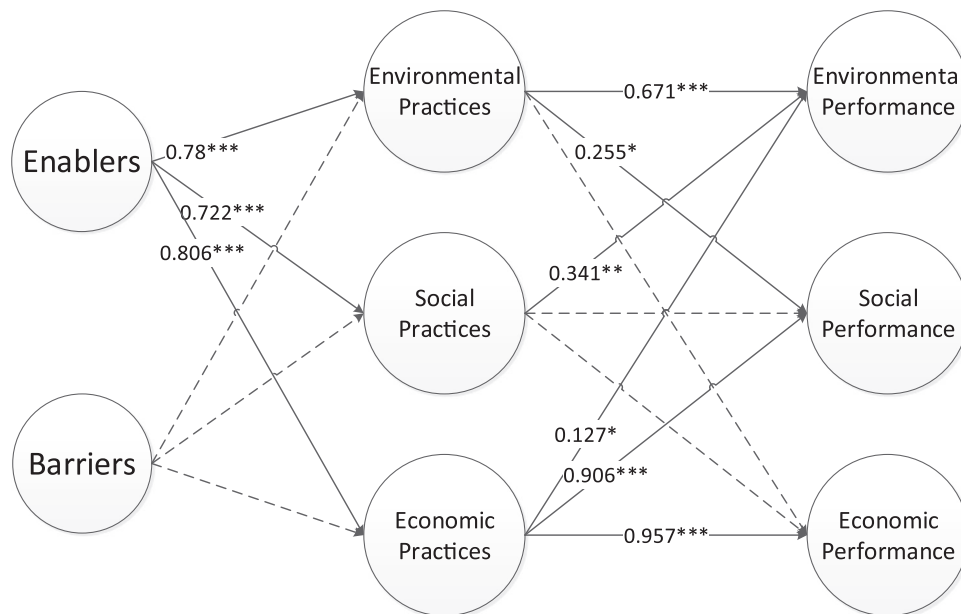
An additional characteristic of French SMEs is the negative effects of the Social Practices on the Economic Performance ( $\beta = -0.871, p < 0.01$ ) and the negative effects of Environmental Practices on the Social Performance dimension ( $\beta = -0.258, p < 0.1$ ).

Next, a structural model which employs the British SME data was assessed (Exhibit 9). The results regarding the British data show again that the construct of Enablers is the most influential among the two constructs of Enablers and Barriers, since it is directly associated to the Environmental Practices ( $\beta = 0.78, p < 0.01$ ), to the Social Practices ( $\beta = 0.722, p < 0.01$ ), and the Economic Practices (beta coefficient = 0.806,  $p$ -value < 0.01), whereas the Barriers factor shows no associations at all with the latent constructs of sustainability Practices.





**EXHIBIT 8** SEM results for the French SMEs (— non-statistically significant association). (\*) 10% level of significance; (\*\*) 5% level of significance; (\*\*\*) 1% level of significance.



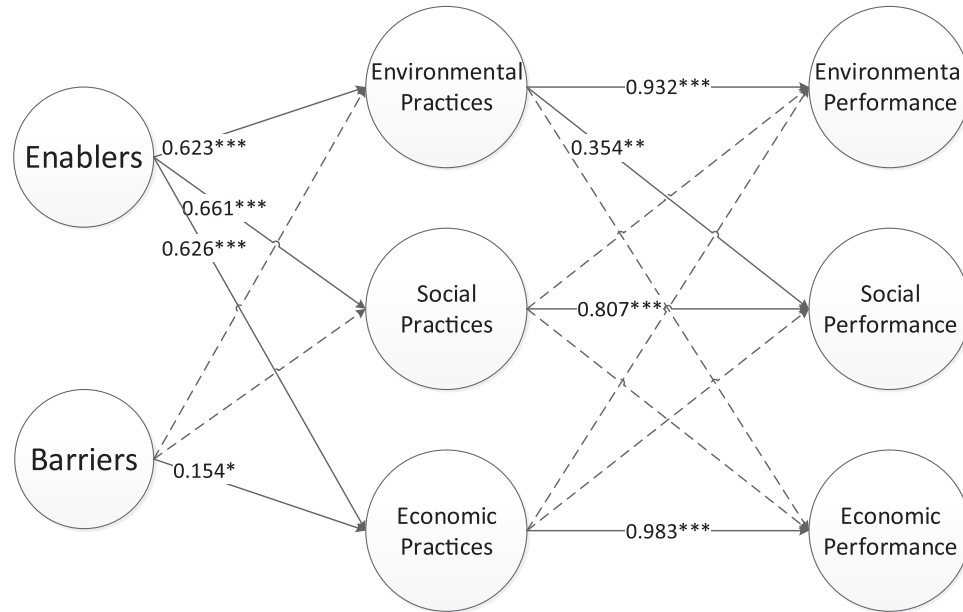
**EXHIBIT 9** SEM results for the British SMEs (— non-statistically significant association). (\*) 10% level of significance; (\*\*) 5% level of significance; (\*\*\*) 1% level of significance.

Most dominant associations among practices and performance is observed between Economic Practices and Economic Performance ( $\beta = 0.957, p < 0.01$ ), Economic Practices and Social Performance ( $\beta = 0.906, p < 0.01$ ), and Environmental Practices and Environmental Performance ( $\beta = 0.671, p < 0.01$ ).

Regarding the fit of the hypothesized model structure on the Greek SME data, we observe once again the superiority of External and

Internal Enablers as moderators of sustainability practices, whereas moderate associations or no associations are observed between the Barriers factor and sustainability practices (Exhibit 10).

Statistically significant connections were presented between Environmental Practices and Environmental Performance which was positive ( $\beta = 0.932, p < 0.01$ ), Social Practices and Social Performance ( $\beta = 0.807, p < 0.01$ ), and Economic Practices and Economic



**EXHIBIT 10** SEM results for the Greek SMEs (— non-statistically significant association). (\*) 10% level of significance; (\*\*) 5% level of significance; (\*\*\*) 1% level of significance.

Performance ( $\beta = 0.983, p < 0.01$ ). However, no other associations are present with only exception the relationship between Environmental Practices and Social Performance ( $\beta = 0.354, p < 0.05$ ).

Finally, Table A3 in Appendix presents all estimated coefficients between the associations of observed items for measuring Enablers and Barriers with the relative latent factors for the different datasets. It is seen from these results that all specific items are highly related to the corresponding factor, which indicates that all measured enablers and barriers are important contributors as perceived by the respondents.

In overall, this analysis has revealed the presence of specific regional characteristics, with most notable being the differentiations observed for the French SME data, when compared to the other three European countries.

#### 4 | DISCUSSION AND CONCLUSIONS

SMEs' sustainability is crucial for every economy as they not only contribute to gross domestic product but employ a major portion of workforce of any country (Dey, Petridis, et al., 2018). However, SMEs' cumulative negative contribution is also substantial. This study sets out to examine the main determinants of supply chain sustainability of SMEs according to SMEs' managers/owners perceptions, by proposing sustainability practice-performance models in order to investigate potential relationships between SMEs practices with supply chain sustainability performance concerning the economic, operational, environmental, and social aspects. Moreover, the influence of the external and internal enablers and barriers upon sustainable practices (economic, environmental and social) is also examined. In doing so, data from 420 SMEs (from the United Kingdom, France, Spain, and Greece) using a structured questionnaire and an online survey tool are utilized

and analyzed through quantitative analysis as well as statistical models and inference.

According to the main findings of the study, Enablers seem to affect significantly all aspects of Sustainability Practices of SMEs (Environmental, Social, Economic) in all participating European countries. More specifically, for Spain, UK, and Greece, there seems to be a high and positive relationship between Enablers and Environmental, Social and Economic practices, whereas for France this relationship is also positive but weaker. This outcome is consistent to the major outcomes of other researches, although held in different countries (see for instance Abdul-Rashid, Sakundarini, Ariffin, et al., 2017; Aboelmaged, 2018; Agan et al., 2013; Cagno & Trianni, 2013; Masocha & Fatoki, 2018). Masocha and Fatoki (2018) suggest that coercive isomorphic forces such as government pressures and other regulatory bodies have an impact on SMEs embarking on economic, environmental and social sustainability practices. Ghadge et al. (2017) also point out that the external drivers such as government, competitors, and customers significantly influence the logistics network in driving the need for environmental improvement.

Internal and External Barriers are also proved to affect Sustainability Practices, but in less extent and with significant differences among countries. More specifically, for France there seems to be a high relationship between Barriers and Environmental, Social, and Economic practices. For Spain, this relationship is also significant but weaker. On the other hand, for British SMEs there seem to be no connection between Barriers and Sustainability Practices in none of the sustainability elements (Environmental, Social, Economic). For Greek SMEs, Barriers are only related with Economic Practices but no effect is found with Environmental and Social Practices. The later outcome is somehow in contrast with the results of Ghadge et al. (2017) research. As pointed out in their research, unorganized returns management is a key

internal factor, so improvement in the product returns management can significantly influence the success of sustainable implementation within the food supply chain (Ghadge et al., 2017)). On the same issue, our research complements the findings of Jabbour et al. (2016) research, regarding the barriers to the adoption of green operational practices at Brazilian SMEs. According to their research, internal barriers are significant during implementation of green operational practices, thus, if companies want to build competitive advantages, they need to focus on increasing the level of green awareness of managers and offering sufficient green training (Jabbour et al., 2016). The differences on the relation between drivers/barriers and sustainability in SMEs at a country level, observed by the current study, were also indicated in previous research (Neri et al., 2021). The authors in an exploratory investigation in 26 SMEs operating in the chemical and metalworking manufacturing sectors across Germany and Italy, highlighted the influence of the country factor sector, as well as other factors such as SME size on the perception of barriers and drivers. Moreover, the presence of a dedicated manager for sustainability, the number of certifications held by a firm, and a holistic definition of sustainability, seem to affect the barriers and drivers perceived by the sampled industrial decision-makers.

Regarding the investigation of the association among Sustainability Practices and Performance, the study reveals significant relationships (but also some weak associations) between Supply Chain Sustainability Practices and Performance, for all participating countries. Again, important diversifications are found among countries, with most notable being the differentiations observed for the French SME data, when compared to the other three European countries. To start with, there seem to be a straightforward, significant positive relationship between Environmental Practices and Environmental Performance, Social Practices and Social Performance and Economic Practices and Economic Performance. The only exception is for British SMEs, where Social Practices and Social Performance are not related. In contrast, Environmental and Social Practices do not seem to affect Economic Performance for three of the four examined countries (Spain, the United Kingdom, Greece). Therefore, European SMEs, in order to optimize their economic performance, need to address all operational sustainability practices, including environmental and social issues and challenges (Dey, Petridis, et al., 2018). For French SMEs, however, Environmental Practices reveal strong positive relationship with Economic Performance, where Social Practices reveal strong negative relationship with Economic Performance. Economic Practices have weak (British SMEs) or no association (France, Spain, Greece) with Environmental Performance, and, moreover, weak (France, Spain), strong (UK) or no association (Greece) with Social Performance. Finally, Environmental Practices appear to have a significant positive (Spain, UK, Greece) or negative (France) effect on Social Performance, where, in contrast, Social Practices are only related to Environmental Performance for Spanish and British SMEs.

## *Regarding the investigation of the association among Sustainability Practices and Performance, the study reveals significant relationships (but also some weak associations) between Supply Chain Sustainability Practices and Performance, for all participating countries*

With respect to the four examined European countries, the strongest relationships between Sustainability Practices and Performance seem to appear for French SMEs, and the weakest for Greek SMEs. The outcomes of our research are partly in line with previous researches, although the feature of the enterprises, the KPIs and the methodologies vary from study to study. Malesios, Dey, et al. (2018) indicate that only specific practices and performances focused on environmental, social, and operational sustainability (e.g., CRM practices, lean practices) seem to benefit an SME's economic performance (see also Malesios et al., 2021). Another crucial result, which is in line with our research outcomes, is that each practice is likely to produce a positive impact on the corresponding sustainable performance but it may not associate positively to others (Dey, Petridis, et al., 2018). Abdul-Rashid, Sakundarini, Ghazilla et al. (2017) suggest that sustainable manufacturing process is the key predictor for sustainability performance (taking into consideration environmental, economic and social performance) among all of the sustainable manufacturing practices investigated. The research of Agan et al. (2013), regarding the relationship between environmental processes and firm performance for Turkish SMEs, also confirms our outcomes for partial association of Environmental Practices and all elements of Sustainability Performance (Environmental, Social, Economic). According to the study, only some of the measured activities of the Environmental Process (Design, Treatment and Environmental Management System (EMS)) are positively related to Performance, whereas other activities (such as Reduction and Recycling) are not. Finally, Jabbour et al. (2016) research, also suggests that green operational practices tend to influence a company's Green and Operational Performance directly, with a stronger influence on green performance and, therefore, green practices tend to improve organizational competitiveness.

Another major finding from our research is the presence of spatial patterns, both for the associations of the various sub-constructs of sustainability practices and performance, and for the associations between enablers and barriers and sustainability practices of European SMEs examined. The information gained from SEM analysis in each country can help both policy makers as well as the SMEs owner/manager to improve sustainability performance taking into consideration the spatial characteristics within the European SMEs.

Further research is necessary in order to examine in more depth the reasons for the specific weak associations between the various sub-constructs of Practices and Performances, as well as between the Internal and External Barriers and Practices. Moreover, to explore the profound differences among countries with different characteristics, so as to gain the different prospects of different economical systems and geographical locations. To do so, further hypotheses could also be tested, perhaps by performing an additional research within the present or a larger sample.

In any case, the outcomes of the study are significant for the policy makers as well as SMEs' owners/managers in order to enhance sustainable performance through strategic, planning, and operational decisions. At a practical level, the present study may assist SMEs' managers to identify the dominant external and internal enablers and barriers affecting their practices, as well as what are the most important practices worthwhile to adopt and at the same time make efforts to increase performance on the less strong.

For further improvement of the current research, we underline some main issues and limitations. First, it was conducted on SMEs; hence, any generalization to large organizations should be made with caution. However, conducting research targeted on SMEs is essential because of their economic significance, role in employment generation, potential for innovation, resource efficiency, local and regional impact, policy implications, diversity of practices, and their place within global supply chains. By focusing on SMEs, researchers can gain insights into a critical segment of the business world and contribute to more effective sustainability strategies and policies.

The study focuses on four European countries (the United Kingdom, France, Spain, and Greece). The findings may not be easily generalizable to SMEs in other regions or countries with different economic, cultural, and regulatory contexts. This limitation has been partly addressed since the selected countries represent a range of economic conditions within Europe and are spread across different regions of Europe, which can introduce geographic diversity into the study.

The research primarily relies on the perceptions of SME managers/owners. It may be valuable to complement this with other perspectives, such as employees or external stakeholders, to gain a more comprehensive view of sustainability practices and performance. This could also entail the use of objective secondary data to capture firms' performance.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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**How to cite this article:** Moursellas, A., Malesios, C., Skouloudis, A., Evangelinos, K., & Dey, P. K. (2023). Perceived enablers and barriers impacting sustainability of small-and-medium sized enterprises: A quantitative analysis in four European countries. *Environmental Quality Management*, 1-16. <https://doi.org/10.1002/tqem.22128>

## APPENDIX: ANNEX

**TABLE A1** Analytical description of the 40 observed items from the SMEs' interview protocol, for the practices and performance factors.

Practices aspects	Performance aspects
<p><b>Economic:</b></p> <ol style="list-style-type: none"> <li>1. Have you set certain financial/economic targets for the next period (the next 5 years)?</li> <li>2. Do you actively seek for national and EU funding on business development and/or investment grants?</li> <li>3. Do you examine/analyze the financial implications of environmental and social issues that relate to our operation?</li> <li>4. Do you seek to hire senior/middle management staff from the local community?</li> <li>5. Do you place significant emphasis on local suppliers and local sourcing?</li> <li>6. Do you place emphasis on the company's infrastructure development?</li> <li>7. Do you place emphasis on the company's salary spending's?</li> </ol> <p><b>Environmental:</b></p> <ol style="list-style-type: none"> <li>1. Do you keep formal records of the raw materials/associated process materials/semi-manufactured goods-parts used in production?</li> <li>2. Do you utilize recycling materials as inputs in your production processes?</li> <li>3. Do you keep track of your energy consumption within the organization?</li> <li>4. Do you keep track of your water consumption within the organization?</li> <li>5. Do you have developed conservation and efficiency initiatives in order to reduce energy consumption?</li> <li>6. Have you developed conservation and efficiency initiatives in order to reduce water consumption?</li> <li>7. Do you keep formal records of your water discharges/effluents?</li> <li>8. Do you have identified potential impacts of your activities, products, and services on biodiversity?</li> <li>9. Do you support recycling, reclaim, and/or recovery of material from waste derived from your production processes?</li> <li>10. Do you keep formal records of the hazardous and non-hazardous waste derived from your production processes?</li> <li>11. Do you screen your suppliers using criteria pertaining to environmental management and performance?</li> <li>12. Have you identified negative environmental impacts in the supply chain and have taken relevant actions to address them?</li> <li>13. How would you rate the resource efficiency of your company?</li> </ol>	<p><b>Economic:</b></p> <ol style="list-style-type: none"> <li>1. Turnover Growth</li> <li>2. Revenue</li> <li>3. Proportion of spending on local suppliers (%)</li> </ol> <p><b>Environmental:</b></p> <ol style="list-style-type: none"> <li>1. Considering your waste production, how efficient would you say is your operation</li> <li>2. Considering your water consumption, how efficient would you say is your operation</li> <li>3. Considering your energy consumption, how efficient would you say is your operation</li> </ol>

(Continues)

**TABLE A1** (Continued)

Practices aspects	Performance aspects
<p><b>Social:</b></p> <ol style="list-style-type: none"> <li>1. Do you have an occupational health and safety management system in place?</li> <li>2. Do the company's workers participate and provide input in health and safety hazard identification and risk assessment performed by the management?</li> <li>3. Do the company's workers receive occupational health and safety training in terms of specific work-related hazards, hazardous activities, and/or hazardous situations?</li> <li>4. Do you have employee training programs to upgrade skills or, if not, do you support your employees in attending external training or education?</li> <li>5. Do you promote diversity within the organization and provide equal opportunities to all staff, both current and prospective employees?</li> <li>6. Do you screen your suppliers using criteria pertaining to human resources management and performance (e.g., elimination of forms of child, forced or compulsory labor)?</li> <li>7. Do you screen your suppliers using criteria pertaining to human resources management and performance (e.g., elimination of forms of child, forced or compulsory labor)?</li> <li>8. Do you assess the health and safety impacts from your products/services for improvement in order to ensure customer protection?</li> <li>9. Do you provide accessible and adequate information on the safe use of your products/services, the disposal of the product, or the sourcing of its components (ingredients)?</li> </ol>	<p><b>Social:</b></p> <ol style="list-style-type: none"> <li>1. What is the (approximate) amount invested in CSR activities by your company in the last year?</li> <li>2. Do you keep records of health and safety data within the enterprise</li> <li>3. Please state how you have engaged with members of the local community</li> <li>4. Any incidents reported of non-compliance concerning the health and safety impacts of products and services over the past 5 years</li> <li>5. The previous 5 years how many cases of fines and non-monetary sanctions for non-compliance with employment laws did your business involved with?</li> </ol>

**TABLE A2** Analytical description of the 15 observed items from the SMEs' interview protocol, for the Enablers and Barriers Factors.

Enablers	Barriers
<ol style="list-style-type: none"> <li>1. Requirement from customer</li> <li>2. Requirement from stakeholders</li> <li>3. Profitable business opportunities</li> <li>4. Competitive pressure</li> <li>5. Regulations from legislative body</li> <li>6. There are fines for not following environmental legislation standards</li> <li>7. Non-compliance to the regulations lead to the bad reputation</li> <li>8. My competitors in the industry have sustainability</li> <li>9. Financial support from governmental if implementing sustainability</li> </ol>	<ol style="list-style-type: none"> <li>1. Lack of time to design, implement and monitor sustainability measures</li> <li>2. Lack of relevant training and expertise by members of the staff</li> <li>3. Financial constraints</li> <li>4. Absence of clear benefits for the firm</li> <li>5. It incurs additional, bureaucratic, internal procedures</li> <li>6. Doubts about the effectiveness of such actions and their objectives</li> </ol>

**TABLE A3** Estimated (standardized) parameters for the associations between barriers /enablers observed items with corresponding latent factors.

Association	Spain Estimate	France Estimate	UK Estimate	Greece Estimate
<i>Enablers</i>				
Requirement from customer → Enablers	0.779**	0.698**	0.581*	0.705**
Requirement from stakeholders → Enablers	0.864**	0.843**	0.609**	0.812**
Profitable business opportunities → Enablers	0.783**	0.652**	0.604*	0.767**
Competitive pressure → Enablers	0.754**	0.775**	0.576*	0.783**
Regulations from legislative body → Enablers	0.789**	0.885**	0.612**	0.672**

(Continues)

**TABLE A3** (Continued)

Association	Spain Estimate	France Estimate	UK Estimate	Greece Estimate
Fines for not following environmental legislation standards → Enablers	0.786**	0.832**	0.607*	0.603*
Non-compliance to the regulations lead to the bad reputation → Enablers	0.767**	0.744**	0.577*	0.655**
My competitors in the industry have sustainability → Enablers	0.776**	0.811**	0.621**	0.695**
Financial support from governmental if implementing sustainability → Enablers	0.795**	0.793**	0.551*	0.598*
<i>Barriers</i>				
Lack of time to design, implement and monitor sustainability measures → Barriers	0.815**	0.675**	0.693**	0.789**
Lack of relevant training and expertise by members of the staff → Barriers	0.789**	0.665**	0.689**	0.708**
Financial constraints → Barriers	0.799**	0.606**	0.537*	0.695**
Absence of clear benefits for the firm → Barriers	0.742**	0.562*	0.677**	0.641**
It incurs additional, bureaucratic, internal procedures → Barriers	0.823**	0.732**	0.621**	0.666**
Doubts about the effectiveness of such actions and their objectives → Barriers	0.786**	0.638**	0.794**	0.724**

\*Significant at the 5% significance level.

\*\*Significant at the 1% significance level.