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# Leaders' sustainability competences and small and medium-sized enterprises outcomes: The role of social entrepreneurial orientation

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## Abstract

The market for socially conscious products and services has grown exponentially in the last years. Consequently, adding social value is among the great challenges that companies have to face nowadays. In view of this, companies need leaders with a set of specific skills that prepares them to act and compete in this new environment. This is especially true for small and medium-sized enterprises (SMEs), which are even more dependent on their leaders' competences. The aim of this article is to analyse the influence of leaders' sustainability competences on the social entrepreneurial orientation of SMEs of the tourism sector, as well as the influence of this strategy on the firm's performance. The methodology used to validate the measurement scales is exploratory and confirmatory factor analysis and the structural equation modelling technique is applied to analyse the causal relationships proposed in the model. The results show that sustainability competences positively affect social entrepreneurial orientation; specifically, the social risk-taking and proactivity competence has a positive influence on the economic and social performance of SMEs, and in particular, on their green innovation performance. These results highlight the key role that leaders' competences have in SMEs' social orientation and thus, the importance of training in competences for sustainable development.

**KEYWORDS**
firm performance, leaders' sustainability competences, SMEs, social entrepreneurial orientation, sustainability competences

## 1 | INTRODUCTION

The concepts of sustainable and social entrepreneurship have gained relevance over recent years (Schaltegger & Wagner, 2011); largely as a result of the increase in demand for environmentally and socially conscious products (Haigh et al., 2015). These concepts arise from the convergence of two areas of knowledge: entrepreneurship and sustainability. Schaltegger and Wagner (2011) define sustainable entrepreneurship as the contribution of business efforts to social, ecological and economic aspects; in other words, to sustainable development. On the other hand, social entrepreneurship from a social perspective (Schaltegger & Wagner, 2011; Zahra et al., 2009) goes

beyond the quest for environmental opportunities from an economic point of view (Zahra et al., 2009); instead, its final objective is the creation of social value (Lans et al., 2014).

In this sense, academics have reached some consensus on the current and future importance of entrepreneurs that focus on sustainability and their key role as agents of change and transformation; particularly in improving their immediate environments and regions of influence (Kyrö, 2015; Parrish & Foxon, 2009). These leaders tend to have a holistic vision of the outcomes of their company based on the philosophy of "the triple bottom line," which focuses on social and environmental concerns just as it does on economic profits. They are able to integrate sustainable values within their company's mission and to work with daily indicators that show the social impact of their entrepreneurial activities (Gagnon, 2012; Ploum et al., 2018).

Any organisation seeking to implement sustainable and social practices requires leaders with the competences to detect entrepreneurial opportunities that are respectful of the environment (Lans et al., 2014), along with the interpersonal skills distinctive of an entrepreneur (Dunphy et al., 2007). In this regard, Lans, Blok and Wesselink (2014, p. 40) identify the following qualities "as the backbone of entrepreneurial competence": opportunity competence, social competence, business competence, industry-specific competence, and entrepreneurial self-efficacy. The authors go on to add that "for sustainable development, companies are in need of owners, managers and staff-members who are able to recognise sustainability as an opportunity, i.e. as a driver for strategic renewal, innovation and venturing" (Lans et al., 2014, p. 37).

If this is important for managers in multinationals and large companies, it is essential for leaders in small- and medium-sized enterprises (SMEs). These enterprises make up for the vast majority of the economic structure in most regions, and if genuine change is sought after, then this sort of human capital represents a cornerstone at base. The question now would be if SME leaders have the necessary skills to bring about such change.

This research contributes to the literature by answering the following questions: How do the leader's sustainability competences influence the company's social entrepreneurial orientation (SEO)? Does social orientation entrepreneurship have a positive influence on the performance of SMEs? The aim of this research is to analyse the effect of leaders' sustainability competences on social orientation entrepreneurship and of this entrepreneurship on business performance, namely, green innovation performance, social performance and economic performance. To meet the objective, a theoretical model will be estimated using the structural equation modelling (SEM) technique and a novel dataset, collected from a sample of 302 tourism SMEs located in Ecuador (sampling error of ±5.44% for a confidence level of 95%).

The novelty of this study lies in examining the relationship between leaders' sustainability competences and SEO in SMEs, in addition to investigating how this entrepreneurship influences SME performance in different areas. A considerable amount of literature has studied the antecedents and consequences of entrepreneurial orientation, such as personality traits, cultural background, Government aided programmes and entrepreneurial education in relation to individual entrepreneurial orientation, (Brush, 2014; Carvalho et al., 2015; Wang & Chen, 2013; Zainol, 2013); however, to the best of our knowledge, none has analysed the relationship between leaders' sustainability competences, SEO and firm performance.

The document is structured as follows. The introduction has already contextualised the subject under study and stated the objective; next, Section 2 will address the theoretical framework for the concepts of sustainability competences and SEO, as well as the relationship between them and the relationship between the performance of SEOs and SMEs. Section 3 will explain the methodology, while Section 4 will present the results and Section 5 will discuss them. A last segment, Section 6, will conclude and draw implications for practitioners.

## 2 | LITERATURE REVIEW

### 2.1 | Leaders' sustainability competences

In 2015, the United Nations announced 17 Sustainable Development Goals (SDGs) and 169 targets in its 2030 Agenda. The SDGs are universal and aimed at achieving global sustainable development. Target 4.7 aims to "ensure that all learners acquire the knowledge and skills necessary to promote sustainable development [...]" (United Nations, 2015). Although the majority can recognise the importance of these objectives, there is still manifest confusion on the best path to achieve them and on how to train future entrepreneurs to fulfil that target. There is a need to better understand the ways in which leader's competences help sustainable entrepreneurship, and at the same time, entrepreneurs and managers need to understand the economic opportunities behind sustainable entrepreneurship to reinforce sustainability at a fundamental and structural level (Lans et al., 2014).

Sustainability requires a system-wide understanding to integrate the complexity of diverse pursuits and stakeholders' interests (e.g., governments, individuals), as well as the ability to assess the effects of potential decisions across different domains and scales (Wiek et al., 2011). For this reason, profound change does not only require state intervention from formal institutions (i.e., new legislation) and the availability of new technologies, it also demands the active and passive support of the population (De Haan, 2006), and even more so of their leaders.

Research on the identification of competences for sustainable development has advanced significantly in recent years, with scholars cultivating different perspectives on training future managers to be more 'sustainable' (Barth et al., 2007; Byrne, 2000; De Haan, 2006; Dentoni et al., 2012; Frisk & Larson, 2011; Haney et al., 2020; Ploum et al., 2018; Segalàs et al., 2009; Sipos et al., 2008; Wiek et al., 2011; Willard et al., 2010). For instance, De Haan (2006) identifies eight key competences that should serve as the basis for the educational standard: foresight thinking; interdisciplinary work and learning; transcultural understanding and cooperation; participation; planning and implementation; empathy, compassion, and solidarity; self-motivation

and motivating others; and distanced reflection on individual and cultural models. Sipos et al. (2008) proposed 18 learning objectives for transformative sustainability learning, from which seven entrepreneurial competences can be drawn: transdisciplinarity, systems thinking, conflict resolution, collaboration, empowerment, creativity, and inclusivity.

Subsequently, Wiek et al. (2011) conducted research to compile the competences studied in the previous literature (28 journal articles and books, and 15 reports and whitepapers), which resulted in the proposal of five key competences in sustainability to help institutions design academic and training programs: systems-thinking competence, anticipatory competence, normative competence, strategic competence, and interpersonal competence. Similarly, Dentoni, Blok, Lans and Wesselink (2012, p. 63) identified seven key competences based on "a literature review on competences for sustainable development and innovation and [...] four focus group discussions with lecturers from 'green' higher education institutes (HEI's) in the Netherlands"; these are systems-thinking, foresight thinking, normative competence, embracing diversity and interdisciplinarity, interpersonal competence, action competence and strategic management.

Based on these two studies, Lans et al. (2014) proposed a qualitative and quantitative study to understand which competences are at the heart of entrepreneurship and sustainable development (i.e., sustainable entrepreneurship). These were defined as follows:

1. Systems-thinking competence is the ability to understand complex systems across different spheres—such as the social, environmental and economic realms—and from the local to the global scale. This will favour problem resolution, seizing opportunities and taking advantage of technologies in a holistic and interconnected manner (Wiek et al., 2011).
2. Foresight thinking is the ability to simultaneously analyse and evaluate the prospect impact that local and short term decisions on the environment, society and the economy will have in the long term and at a global scale (Wiek et al., 2011).
3. Strategic management is the ability to collectively design and implement projects that lead companies to develop sustainable development practices (Lans et al., 2014; Ploum et al., 2018). This individual skill will be key to effectively design sustainability transition strategies (Wiek et al., 2011)
4. Normative competence is the ability to design, reconcile and apply sustainable values, principles, and targets with internal and external stakeholders (Wiek et al., 2011; Ploum et al., 2018). This skill is important to balance and build up socioeconomic activities and environmental capacities (Swart et al., 2004).
5. Action competence is the ability to become actively involved in responsible actions to improve the sustainability of socio-ecological systems (Lans et al., 2014; Ploum et al., 2018)
6. Embracing diversity and multidisciplinary is the ability to organise relationships and recognise the legitimacy of different viewpoints in business decision-making processes regarding environmental, social and economic issues, while promoting sharing and learning between different groups (Lans et al., 2014; Wiek et al., 2011).
7. Interpersonal competence is the ability to conduct collaborative and participatory sustainability research, as well as problem solving (Wiek et al., 2011). This includes all of those skills that have an influence on the interaction with other people and that drive to teamwork and alliances, such as communication, leadership, negotiation or empathy.

After closer examination, the strategic management and action competences were combined into a single one, seeing that there was an obvious overlap between them given that both had been traditionally important for entrepreneurs and for sustainability, in terms of the centrality of complex problems and the importance of novelty/creativity, self-enrolment and engagement with others (Lans et al., 2014). In short, organisations are in need of founders, managers and employees who are able to recognise sustainability as an opportunity (Lans et al., 2014; Ploum et al., 2018).

## 2.2 | Social entrepreneurial orientation

Entrepreneurial orientation (EO) has emerged as a major construct within the strategic management and entrepreneurship literature over the years (Liu & Huang, 2020; Morris et al., 2012). "EO can be defined as the nature of the decision-making mindset, behaviours and processes underpinning the firm's strategy creation practice, competitive posture and management philosophy and thus encapsulates the entrepreneurial tendencies of the firm" (Hughes et al., 2015, p. 119). Several characteristics have been grouped together with EO, including autonomy and competitive aggressiveness (Lim & Envick, 2013; Lumpkin & Dess, 1996), although the characteristics receiving the most attention in the literature have been innovativeness, proactiveness and risk propensity (Covin & Slevin, 1989; Halberstadt et al., 2021; Lim & Envick, 2013; Lumpkin & Dess, 1996; Wiklund & Shepherd, 2005). In this regard, Miller (1983) defined EO as a company that is involved in innovation, undertakes risky ventures and pursues opportunities proactively.

On the other hand, the social side of entrepreneurship has increasingly attracted academic interest, thereby social entrepreneurship has become a prominent literature stream in the last decade, with most definitions of this concept highlighting the "hybrid nature of combining a social mission with entrepreneurial activities" (Saebi et al., 2019, p. 3). For example, the term 'social business hybrids' is applied to those organisations that "create value for society in areas where markets and governments are failing, while developing financially sustainable operations that leverage commercial contracts and enable them to achieve scale" (Santos et al., 2015, p. 38). However, the controversy on which unit of analysis the concept of social entrepreneurship is under still persists and makes finding a universal definition difficult (Foss & Saebi, 2017; Gali et al., 2020; Sulphey & Salim, 2020). What is undeniable is the increasing trend in academia to try and understand the levels and impacts of 'transformativeness' that companies are having in society. If impact is

understood as the "value created by the organisation for society in achieving its mission, which may include environmental benefits and social gains" (Santos et al., 2015, p. 39), then the social orientation of any type of company favours a greater redistribution of resources towards the disadvantaged, their communities and their society, simultaneously creating value (Hlady-Rispal & Servantie, 2018). As a consequence, it is becoming increasingly difficult to find the line that separates commercial from social/sustainable companies.

Based on the previous literature, this research defines SEO as the tendency of any business to adapt its strategies and management decisions to a social entrepreneurial perspective, which implies engaging in innovations that add social value to the community and include a social approach in its design. SEO involves assuming a certain amount of risk in the firm's decisions and being proactive in the search for social benefits, and it will depend on the weight that companies attribute to social innovation, which will require balancing the social gains and the economic profits that all organisations produce. Weerawardena et al. (2003) considered SEO as a multidimensional construct what includes "the expression of entrepreneurially virtuous behavior to achieve the social mission," which implies, on the one hand, the ability to recognise opportunities capable of creating social value, as well as the consideration of certain key characteristics in decision making such as innovativeness, proactiveness and risk-taking (Liu & Huang, 2020; Sulphey & Salim, 2020). The three main dimensions of SEO are outlined below (Liu & Huang, 2020; Sulphey & Salim, 2020; Turpin & Shier, 2020):

1. Social innovativeness reflects the tendency of a company to encourage, engage with and enrol in new ideas and creative processes with the ability to achieve social impact or solve a social problem. If the degree of novelty is key in any industry and competitive context, then it is even more necessary to solve social problems competitively.
2. Social proactiveness refers to a stance of anticipating future social demands and needs in the marketplace, thereby creating a first-mover advantage over competitors. It involves foreseeing entrepreneurial opportunities behind social problems with a vision to solve them in an economic and sustainable way.
3. Social risk-taking or risk propensity is associated with a willingness to commit resources and time to projects with a social impact or a social mission, in spite of the uncertainty in outcomes or net profits for the company. Any entrepreneurial decision involves uncertain results, but the risk associated when trying to balance social and profit objectives can even be higher.

According to Santos et al. (2015), any type of company starts to realise that addressing societal issues is often a good business in itself as a result of three elements: a) Societal demand, from the increase in users and customers of socially oriented products and services, also caused by the higher pricing power of producers; attention to this kind of demand can help companies innovate and rethink their business model, as well as potential innovations and changes related to social products; b) Value chain efficiency, which means using a simpler value chain to obtain the same outcomes and is a social innovation with the power to reduce costs; and c) impact on communities, where the social responsibility project has the potential to help communities and create goodwill. In this way, the social orientation of any type of company and in any type of sector gradually begins to be valued by users, which increases the possibilities of becoming competitive in the market. For many public institutions, social orientation has already become an imperative, and will eventually stop being exclusive at all; instead, it will give advantages over competitors and improve competitiveness overall. Therefore, companies that know how to adapt their mission to social and sustainable values will have a higher chance of survival (Santos et al., 2015).

## 2.3 | The importance of leaders' sustainability competences for the SEO of SMEs

In the context of SMEs, leaders are a key source of value creation when interacting with a value network that contributes to the organisation with means and opportunities (Gallego-Roquelaure, 2020; Hlady-Rispal & Servantie, 2018). In fact, leaders are one of the key intangible assets to overcome the well-known liability of smallness and newness (Stinchcombe, 1965). Therefore, the orientation of strategies and actions of these companies towards social concerns will be strongly determined by the inclinations and skills of their leaders.

Individual competencies for sustainable development have received attention in the field of education (Wiek et al., 2011), where researchers have sought to emphasise the importance for future leaders to acquire the necessary skills and abilities to deal with the challenges created by the new sustainability goals (Dentoni et al., 2012). Along these lines, Osagie et al. (2016) revealed that strategic sustainability competences were critical when leaders had the authority and ability to develop corporate social responsibility (CSR) strategies. For a small enterprise to go for ambitious plans with social impact and anticipate its customers' demands, it will require a certain type of skills from its leaders. In contrast with larger companies, that maintain entire departments in charge of CSR, SMEs cannot usually afford this practice. The more proficient leaders are in these competences, the more likely they are to exploit sustainable opportunities and to implement more innovative and aggressive social practices, and the deeper their understanding of entrepreneurial opportunities behind social problems.

Therefore, it is essential to analyse to what extent the leader's sustainability competences influence the dimensions of SEO—social innovativeness, social risk-taking and social proactiveness—. Based on this statement, this work posits the following hypotheses:

**H1.** *There is a positive and direct relationship between leaders' sustainability competences and the social innovativeness dimension of the social entrepreneurial orientation of small and medium-sized enterprises.*

**H2.** *There is a positive and direct relationship between leaders' sustainability competences and the social proactiveness and risk-taking dimension of the social entrepreneurial orientation of small and medium-sized enterprises.*

### 2.4 | Social entrepreneurial orientation and SME performance

Empirical evidence consistently shows that entrepreneurial orientation can be a driver of firm performance and growth, regardless of different sizes and types of organisations (Eggers et al., 2013; Wiklung & Shepherd, 2005; Zahra & Covin, 1995), especially in a turbulent market environment (Baker & Sinkula, 2009; Covin & Slevin, 1989). The market of sustainable and socially responsible products is growing in many countries, although their demand is still uncertain in many economies, and in fact, social orientation has started to emerge as a mandatory quality for companies in some industries and with a specific type of clients.

Authors such as Kuratko et al. (2017) highlight the importance of social proactivity in the successful implementation of a corporate social entrepreneurship strategy. Moreover, social proactiveness benefits SMEs when they are perceived as genuinely committed to the community and the environment by their customers and stakeholders in general. Their mission and social actions will not be condemned as a mere cover to remain competitive in the market (e.g., legal requirements of public organisations) or simply as a reaction to consumer pressure; instead, their actions towards sustainability will be well-received as a voluntary choice and a consequence of true organisational values. Being socially innovative and proactive can actually benefit the brand when actions are perceived as authentic, positively changing business performance (Covin & Slevin, 1989; Keh et al., 2007; Lee et al., 2001; Lumpkin & Dess, 1996, 2001; Wiklund & Shepherd, 2005; Zahra & Covin, 1995).

Based on these assumptions, secondary hypotheses result from this research:

**H3.** *There is a positive and direct relationship between social innovativeness and green innovation performance in small/medium-sized enterprises.*

**H4.** *There is a positive and direct relationship between social innovativeness and social performance in small/medium-sized enterprises.*

**H5.** *There is a positive and direct relationship between social innovativeness and economic performance in small/medium-sized enterprises.*

**H6.** *There is a positive and direct relationship between social proactiveness and risk-taking and green innovation performance in small/medium-sized enterprises.*

**H7.** *There is a positive and direct relationship between social proactiveness and risk-taking and social performance in small/medium-sized enterprises.*

**H8.** *There is a positive and direct relationship between social proactiveness and risk-taking and economic performance in small/medium-sized enterprises.*

Figure 1 summarises the relationships and hypotheses proposed between the concepts.

## 3 | METHODOLOGY

### 3.1 | Universe of the study, questionnaire, and measurement

The target population universe comprises the companies in the tourism sector of Ecuador that are classified as SMEs by the Superintendence of Companies, Securities and Insurance of Ecuador. In total, 23,922 SMEs are registered in the Superintendence's database.

The data used here were collected through a structured questionnaire designed to measure the latent variables of the proposed model and to profile the respondents. Regarding measurement scales for each latent variable, the internal validity requirement was met by including items previously used in other investigations (Churchill, 1979). Specifically, the scale of competences on sustainable entrepreneurship has a total of 23 items adapted from the scale of Lans et al. (2014); while the scale of SEO includes 12 items —5 for social innovativeness and 7 for social proactiveness and risk-taking—, adapted from Kraus et al. (2017). The five items presented in Hormiga et al. (2011) were used to measure economic performance, and four items from the scale of Hosseininia and Ramezani (2016) were considered and adapted to measure social performance, plus 8 items to measure green innovation performance. Table S1 contains the list of all items by scale. Finally, the five-point Likert scale was used for the questionnaire responses, where 1 stands for 'totally disagree' and 5 for 'totally agree'. A pre-test confirmed the validity and clarity of the items, and revealed the necessary adjustments to be made before the actual questionnaire.

A sample of 302 valid questionnaires was obtained from the print and mail distributions, representing a response rate of 10.33% with a sampling error of ±5.44% for a confidence level of 95% ($Z = 1.96$, $p = q = .5$). Regarding the profile of the sample, 52.32% of those surveyed were men and 47.68% were women, 66.89% were in the 36–55 age range and approximately 96% had attended university.

The problem of the common method bias (CMB), that may arise from data collected from a single source (structured survey), was addressed through Harman's single-factor test and through CMB post control measures (Podsakoff & Organ, 1986) estimated using SPSS (Statistical Package for the Social Sciences) software. The tests did not detect a single factor that could explain most of the total variance (>50%), which confirmed the non-existence of the common method problem in this research.

### 3.2 | Data analysis

#### 3.2.1 | Model validation

The validation process of the measurement scales was performed in two phases. The first stage was an exploratory factor analysis (EFA)

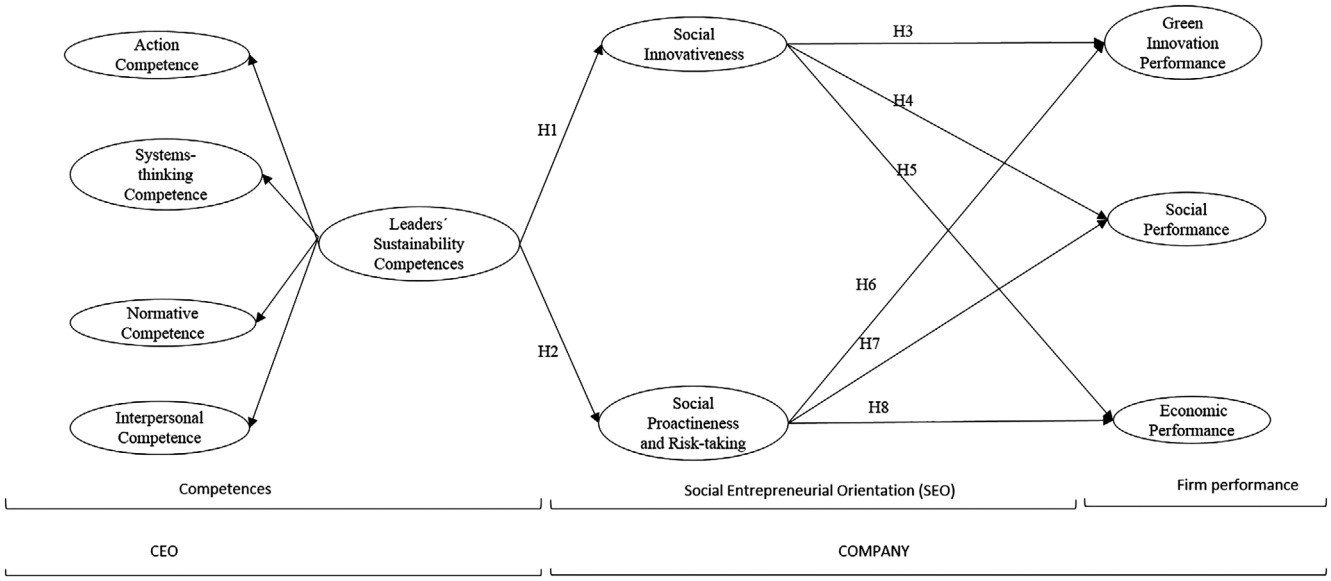


**FIGURE 1** Relationship between leaders' sustainable entrepreneurship competences, social entrepreneurial orientation and performance in SMEs. *Source*: Authors' own design

built in the statistical program SPSS (version 19.0); the second phase executed a confirmatory factor analysis (CFA) using the software AMOS (Analysis of Moment Structures 25.0).

Cronbach's $\alpha$ (1951) tested the reliability of the EFA, its coefficient must be greater than .7 for confirmatory studies (Nunnally, 1979); the values of the item-total correlations were also examined, which must be greater than .3 (Nurosis, 1993); items that did not meet these parameters were removed from the scale. In addition, the unidimensionality of the scales was tested to determine which observable variables loaded on which latent variables. The exploratory analysis was conducted by choosing ML as the extraction method and Varimax as the type of rotation, because it distributes the variance among the different factors (Osborne & Costello, 2009); the loadings should be higher than .05 and the percentage of the explained variance higher than 50% (Hair et al., 1999).

A first-order CFA was implemented in the second stage of the scale purification process, which consists of dropping some of the observable variables to retain only those that best represent the latent variables. The ML method was used to examine the reliability and validity of the measurement model, the structural model and the global model of each of the scales. To begin with, the non-existence of offending estimates was confirmed; these are negative or non-significant error variances, standardised coefficients that exceed or are very close to 1.0, or unusually large SEs (Hair et al., 1999, p. 637).

The global model is evaluated by examining its goodness-of-fit indicators (Jöreskog & Sörbom, 1993; Lévy Mangin & Varela Mallou, 2006). There are three types of global fit measures: absolute, incremental and parsimonious (Bollen & Long, 1993). The measures of absolute fit determine the accuracy of the global model in predicting the covariance matrix: the chi-square ($\chi^2$) and significance level ($p$) indices are very sensitive to the sample size, and may not be reliable when they are excessively large (Bagozzi & Yi, 1988); the goodness of fit index (GFI) shows an acceptable fit for values close to 0.9 (Jöreskog & Sörbom, 1993) and the root mean square error of approximation (RMSEA) represents a reasonable error when values are close to 0.08 (Browne & Cudeck, 1993).

On the other hand, incremental fit indices compare the model under analysis with a base model commonly known as the null (Lévy Mangin & Varela Mallou, 2006); the most frequently used measures are the comparative fit index (CFI)—which is recommended over the chi-square ($\chi^2$) for samples greater than 100–, the adjusted goodness of fit index (AGFI), the normed fit index (NFI) and the Tucker–Lewis index (TLI); a value close to 0.9 is recommended for all of them. Finally, the parsimony fit indices relate the goodness of fit of the model with the number of coefficients necessary to achieve that level of fit (Lévy Mangin & Varela Mallou, 2006); this research will estimate the normalised chi-square ($\chi^2$/df), which has desirable values of around 2, 3, or 5 (Hair et al., 1999; Jöreskog & Sörbom, 1993).

To evaluate the measurement model, its reliability is examined again (Lévy Mangin & Varela Mallou, 2006) through the composite reliability (CR) coefficients and the square root of the average variance extracted (AVE) for each construct; their recommended levels are ~0.7 for the former (Fornell & Larcker, 1981) and over 0.5 for the latter (Hair et al., 1999). To evaluate the structural model, the significance of all estimators in the model is re-examined using the critical ratio for a regression weight (t-student), which must exceed ±1.96, and the standard regression weight ($\beta$), which is usually higher than 0.6 (Jöreskog & Sörbom, 1993). If these criteria were not met, the scales were eliminated and the model re-specified, until all the indices approached their advisable levels.

### 3.2.2 | Structural equation modelling

Once the scales have been validated, the hypotheses raised in the proposed theoretical model are tested. To sum up, this validation

process included the specification and identification of the model, the estimation of parameters, the evaluation of the fit of the model to the data and finally, the respecification of the model when necessary (Lévy Mangin & Varela Mallou, 2006). To test the hypotheses, the methodology used SEM, also known as covariance structure modelling, while the ML was used to estimate the model. The bootstrap technique with 500 samples was applied to solve the problems arising from the absence of normality. The next stage evaluated and adjusted the model, which allowed us to contrast the proposed hypotheses and the global interpretation of the model. For the global fit of the model, please refer to the indicators of absolute, incremental and parsimony fit set out in Section 3.2.1.

To evaluate the fit of the measurement and structural models, first, the statistical significance of each loading between the indicator and the latent variable was examined (*t* student below ±1.96). Next, the reliability of each of the indicators was analysed, as well as the CR of each construct shown by the parameter $R^2$, which indicates the amount of variance of the construct that is explained by the model. In the last stage, the model was respecified when necessary to improve its fit.

## 4 | RESULTS

### 4.1 | Measurement model

#### 4.1.1 | Scale of leader's sustainability competences

Results from the EFA show that total item-correlation is above 0.3, which makes item elimination unnecessary, while the reliability

**TABLE 1** Descriptive findings and exploratory factor analysis (reliability and validity of scales)

| | | | | Exploratory factor analysis (rotated component matrix or loadings) | | | |
|---|---|---|---|---|---|---|---|
| **Factors** | **Scale items** | **Mean** | **SD** | **Factor 1** | **Factor 2** | **Factor 3** | **Factor 4** |
| *Systems-thinking competence* (Cronbach's $\alpha$: .887) | STC1 | 4.06 | 1.09 | 0.646 | | | |
| | STC2 | 4.18 | 0.95 | 0.730 | | | |
| | STC3 | 4.14 | 0.95 | 0.780 | | | |
| | STC4 | 4.12 | 0.95 | 0.789 | | | |
| | STC5 | 4.19 | 0.90 | 0.697 | | | |
| | STC6 | 4.09 | 1.03 | 0.599 | | | |
| | STC7 | 4.24 | 0.94 | 0.571 | | | |
| *Action competence* (Cronbach's $\alpha$: .834) | AC1 | 4.16 | 0.89 | | 0.794 | | |
| | AC2 | 4.12 | 0.88 | | 0.717 | | |
| | AC3 | 3.96 | 1.07 | | 0.758 | | |
| | AC4 | 4.11 | 1.09 | | 0.552 | | |
| | AC5 | 3.89 | 1.17 | | 0.785 | | |
| *Normative competence* (Cronbach's $\alpha$: .859) | NC1 | 4.48 | 0.70 | | | 0.754 | |
| | NC2 | 4.40 | 0.87 | | | 0.579 | |
| | NC3 | 4.50 | 0.73 | | | 0.695 | |
| | NC4 | 4.54 | 0.72 | | | 0.759 | |
| | NC5 | 4.50 | 0.75 | | | 0.658 | |
| | NC6 | 4.36 | 0.88 | | | 0.442 | |
| *Interpersonal competence* (Cronbach's $\alpha$: .788) | IC1 | 4.22 | 0.88 | | | | 0.556 |
| | IC2 | 4.01 | 1.10 | | | | 0.596 |
| | IC3 | 4.47 | 0.89 | | | | 0.670 |
| | IC4 | 4.37 | 0.85 | | | | 0.646 |
| | IC5 | 4.45 | 0.82 | | | | 0.531 |
| *Eigen value* | | | | 4.332 | 4.165 | 3.756 | 2.427 |
| *% Explained variance factor* | | | | 18.834 | 18.109 | 16.330 | 10.553 |
| *% Cumulative variance explained* | | | | 18.834 | 36.943 | 53.825 | 63.825 |
| *Bartlett's test of sphericity*<br>*Kaiser–Meyer Olkin index* | $\chi^2$(sig.): 4407.383 (0.000)<br>KMO: 0.903<br>Measure of simple adequacy (MSA): (0.900–0.896)<br>% Variance: 63.825 | | | | | | |

*Note*: The Bartlett's test of sphericity and the Kaiser–Meyer Olkin index show if the data obtained through the questionnaire is adequate to perform factor analysis. Their requirements are: Bartlett's sphericity test $\chi^2$ (sig <.05), KMO >0.9 very good, MSA = unacceptable for values below 0.5. The detailed list of scale items can be found in Table S1.

*Source*: Authors' own data and estimations.

measured through Cronbach's $\alpha$ is higher than the minimum recommended of .7. Considering that the scale corresponds to the research carried out by Lans et al. (2014) through focus groups, it is necessary to analyse its structure (unidimensionality). To this end, the analysis used the ML extraction method and the Varimax rotation type. Table 1 shows the descriptive findings; factor loadings lower than 0.4 were eliminated to facilitate interpretation. The names of the scale items have been shortened in order to simplify the presentation of results, and will be referred to by their mnemonic from here on (see Table S1 for a detailed list of items).

Following Lans et al. (2014, p. 40), Factor 1 represents the ability to identify and analyse all relevant subsystems, known as systems-thinking competence; Factor 2 stands for the action competence, which is the ability to actively engage in responsible actions to improve the sustainability of socio-ecological systems (Ellis & Weekes, 2008; Mogensen & Schnack, 2010); Factor 3 is the ability to apply and reconcile sustainability values, principles, and objectives, or normative competence (Wiek et al., 2011); and Factor 4 is the interpersonal competence, or the skills to communicate, collaborate and negotiate with empathy and compassion (De Haan, 2006; Wiek et al., 2011). Considering the criterion of a percentage of the cumulative variance explained greater than 50%, the four factors aforementioned can explain the result of 63.825. On the other hand, all the loadings are above the recommended minimum of 0.5. Therefore, the solution is satisfactory.

Continuing with the analysis, the CFA is applied, which informs whether the competences for sustainable entrepreneurship are a multidimensional concept formed by four dimensions or whether each construct should be considered separately. Then, a rival model strategy is introduced (Hair et al., 1999). In the first place, Model 1 consisting of one variable and 23 items is proposed, where all items load on a single factor; second, a first-order Model 2 with 4 variables and 23 items was proposed to improve the fit of Model 1. The results showed that Model 2 did provide a better fit for the data than Model 1. In order to improve the fit further, Model 2 was then respecified into Model 3, obtaining the desired results. The four factors were found to be strongly correlated, which suggested that there may be a second-order factor to explain the three latent factors; this was the reason for proposing Model 4, of second order with 5 variables and 20 items. The goodness-of-fit indices for these models are summarised in Table 2.

As observed in Table 2, the results confirm that the optimal measurement model is a second-order model, in which the competences for sustainable entrepreneurship consist of four dimensions. Table 3 shows the results of the CFA scales; items SFTC6, IC1 and IC2 are eliminated because their factor loadings were not significant. The rest of the items have a standard regression weight of $\beta$ > .50 and are statistically significant (critical coefficient >±1.96). The model shows good measures of absolute, incremental and parsimony fit. All the indicators have values within generally accepted limits.

The average variance (AV) and CR consider the reliability of the scale. Table 3 shows that all the scales take values above the recommended values of 0.5 for the AV and 0.7 for the CR (Bagozzi & Yi, 1988; Hair et al., 1999). Content validity was ensured by the literature review and the pre-test carried out, while convergent validity was verified in two steps: first, it is verified that $\beta$ > .5 and is statistically significant (*t* student > ±1.96); second, it is confirmed that AV >0.5. It can then be concluded that there is convergent validity.

### 4.1.2 | Scale of SEO

We follow the same steps as in the previous scale. The EFA shows that the total item-correlation is above .3, indicating that item elimination is not necessary, while Cronbach's $\alpha$ yields higher than .7, which indicates that the scale is reliable. In the unidimensionality analysis, two factors can explain the result of 57.062 in the percentage of cumulative variance explained for Factor 2, which is above 50%, and loadings above 0.5: Factor 1 of social innovativeness and Factor 2 of social proactiveness and risk-taking, as shown in Table 4.

Then, a CFA is applied to confirm the unidimensionality of the constructs. Table 5 shows the goodness-of-fit indices for the proposed models. The respecified first-order model (Model 3) is the one with the best fit to the data. Therefore, both constructs are considered separately.

Table 6 shows the results of the CFA; items SI4 and SI5 are eliminated since their factor loadings were not significant. The rest of the indicators confirm $\beta$ > .50 and significance. The model shows good measures of absolute, incremental and parsimony fit. All the indicators have values within generally accepted limits.

The reliability of the scale is analysed once more: AV >0.5 and CR >0.7. The validity of the content, as in the previous scale, was verified

**TABLE 2** Fit indices for the models

| Models | $\chi^2$ | df | $\chi^2$ (df) | *p* | GFI | AGFI | TLI | CFI | RMSEA |
|---|---|---|---|---|---|---|---|---|---|
| *Model 1* (1 variable, 23 items) | 1787.436 | 230 | 7.771 | .000 | 0.598 | 0.517 | 0.600 | 0.636 | 0.150 |
| *Model 2—First order* (4 variables, 23 items) | 701.365 | 164 | 4.277 | .000 | 0.818 | 0.766 | 0.829 | 0.852 | 0.104 |
| *Model 3—Respecified Model 2* (4 variables, 20 items) | 501.365 | 155 | 3.236 | .000 | 0.871 | 0.826 | 0.883 | 0.905 | 0.086 |
| *Model 4—Second order respecified Model 2* (5 variables, 20 items) | 482.172 | 155 | 3.111 | .000 | 0.874 | 0.830 | 0.890 | 0.910 | 0.084 |

Abbreviations: AGFI, adjusted goodness of fit index; CFI, comparative fit index; df, degrees of freedom; GFI, goodness-of-fit index; *p*, significance *p* value; RMSEA, root mean square error of approximation; TLI, Tucker–Lewis index; $\chi^2$, chi-square; $\chi^2$/df, normalised chi-square.
Source: Authors' own data and estimations.

**TABLE 3** Reliability and confirmatory factor analysis

| Scales | Scale items | $\beta$ | CR | AV | Confirmatory factory analysis (second order) Composite reliability test |
|---|---|---|---|---|---|
| *Action competence* (Cronbach's $\alpha$: .834) | AC1 | .724 | 0.90 | 0.59 | $\chi^2$(df5) = 482.172 ($p$ = .000), GFI = 0.874, AGFI = 0.830, CFI = 0.910 RMSEA = 0.084, Normalised $\chi^2$ ($\chi^2$/df) = 3.111 |
| | AC2 | .630 | | | |
| | AC3 | .775 | | | |
| | AC4 | .691 | | | |
| | AC5 | .768 | | | |
| *Systems-thinking competence* (Cronbach's $\alpha$: .887) | STC1 | .676 | 0.84 | 0.51 | |
| | STC2 | .858 | | | |
| | STC3 | .913 | | | |
| | STC4 | .777 | | | |
| | STC5 | .679 | | | |
| | STC7 | .614 | | | |
| *Normative competence* (Cronbach's $\alpha$: .859) | NC1 | .484 | 0.92 | 0.66 | |
| | NC2 | .570 | | | |
| | NC3 | .890 | | | |
| | NC4 | .911 | | | |
| | NC5 | .812 | | | |
| | NC6 | .679 | | | |
| *Interpersonal competence* (Cronbach's $\alpha$: .788) | IC3 | .667 | 0.82 | 0.61 | |
| | IC4 | .714 | | | |
| | IC5 | .811 | | | |

*Note*: The detailed list of scale items can be found in Table S1. $p$ < .001.
Abbreviations: AV, average variance; CR, composite reliability; $\beta$, standard regression weight.
*Source*: Authors' own data and estimations.

by the literature review and the pre-test carried out. Observing that $\beta$ > .5, $t$ student >1.96 (statistically significant) and AV >0.5, convergent validity is confirmed.

### 4.1.3 | Scale of firm performance

The EFA reveals that it is not necessary to eliminate any item, total item-correlation is greater than .3, while Cronbach's $\alpha$ is greater than .7, indicating that the scales are reliable. From the unidimensionality analysis of the scale of firm performance, three factors can explain the result of 61.038 >50%; in all scales, the loadings are greater than .5. The factors identified are Factor 1, of economic performance, which refers to profits; Factor 2, of green innovation performance, which is concerned with environmental management and ecological practices that help companies achieve greater efficiency, establish, and strengthen their basic competences and improve their green image (Albort-Morant et al., 2016); and Factor 3, of social performance, understood as the effective translation of the social objectives of an institution into practice (Table 7).

The next step is the application of the CFA to confirm unidimensionality. For this purpose, four models are proposed, their composition can be seen in Table 8. Comparing the goodness-of-fit indices of the proposed models, Model 3 emerges as the best model; this is, Model 2 respecified with 3 variables and 15 items. The items GP5, GP6, and GP7 were eliminated as the factor loadings were not significant. The rest of the indicators show $\beta$ > .50 and critical coefficient >±1.96 (significant). The model shows good measures of absolute, incremental and parsimony fit; all indicators have values within generally accepted limits. The correlations were low in Model 3, so it was possible that the three factors were not loading on a single factor called result (Model 4 of second order); after verification, it was confirmed that this was the case. The constructs are worked separately.

The reliability of the scale is analysed again. The AV is higher than .5 and the CR higher than .7, indicating good reliability. Content validity was verified by the literature review and the pre-test carried out. Observing that $\beta$ > .5, $t$ student >±1.96, and AV >0.5, convergent validity is confirmed, as shown in Table 9.

To finalise the analysis of results, the discriminant validity of each scale was examined in three steps: (1) to confirm that the Cronbach's $\alpha$ of each scale is higher than any of the correlations between that scale and the other scales; (2) to establish that inter-scale correlations are less than the square root of the AVE (Chin, 1998; Fornell & Larcker, 1981), (3) to corroborate that none of the confidence

**TABLE 4** Descriptive findings and exploratory factor analysis (reliability and validity of scales)

| Constructs included SEM | Scale items | Mean | SD | Exploratory factor analysis (loadings) Factor 1 | Factor 2 |
|---|---|---|---|---|---|
| *Social innovativeness* (Cronbach's $\alpha$: .810) | SI1 | 3.97 | 0.94 | 0.823 | |
| | SI2 | 3.99 | 0.89 | 0.806 | |
| | SI3 | 4.08 | 0.85 | 0.776 | |
| | SI4 | 4.49 | 0.68 | 0.555 | |
| | SI5 | 4.40 | 0.87 | 0.550 | |
| *Social proactiveness and risk-taking* (Cronbach's $\alpha$: .825) | RPS1 | 4.16 | 0.88 | | 0.759 |
| | RPS2 | 4.12 | 0.87 | | 0.701 |
| | RPS3 | 3.95 | 1.07 | | 0.782 |
| | RPS4 | 4.21 | 0.88 | | 0.576 |
| | RPS5 | 4.02 | 1.10 | | 0.656 |
| | RPS6 | 4.10 | 1.11 | | 0.626 |
| | RPS7 | 3.87 | 1.18 | | 0.800 |
| *Eigen value* | | | | 3.793 | 3.054 |
| *% Explained variance factor* | | | | 31.610 | 25.452 |
| *% Cumulative variance explained* | | | | 31.610 | 57.062 |
| *Bartlett's test of sphericity*<br>*Kaiser–Meyer Olkin index* | $\chi^2$(sig.): 1933.527 (.000)<br>KMO: 0.845<br>Measure of simple adequacy: (0.804–0.888)<br>% Variance: 57.062 | | | | |

*Note*: The Bartlett's test of sphericity and the Kaiser–Meyer Olkin index show if the data obtained through the questionnaire is adequate to perform factor analysis. Their requirements are: Bartlett's sphericity test $\chi^2$ (sig <.05), KMO >0.8 good, MSA = unacceptable for values below 0.5. The detailed list of scale items can be found in Table S1.
*Source*: Authors' own data and estimations.

**TABLE 5** Fit indices for the models

| Models | $\chi^2$ | df | $\chi^2$ (df) | *p* | GFI | AGFI | TLI | CFI | RMSEA |
|---|---|---|---|---|---|---|---|---|---|
| *Model 1* (1 variable, 12 items) | 675.352 | 54 | 12.507 | .000 | 0.588 | 0.495 | 0.600 | 0.673 | 0.196 |
| *Model 2—First order* (2 variables, 12 items) | 373.637 | 53 | 7.050 | .000 | 0.737 | 0.558 | 0.790 | 0.831 | 0.142 |
| *Model 3—Respecified Model 2* (2 variables, 10 items) | 79.697 | 30 | 2.657 | .000 | 0.951 | 0.910 | 0.956 | 0.971 | 0.074 |
| *Model 4—Second order, respecified Model 2* (3 variables, 10 items) | 146.864 | 31 | 4.738 | .000 | 0.909 | 0.839 | 0.900 | 0.931 | 0.111 |

Abbreviations: AGFI, adjusted goodness of fit index; CFI, comparative fit index; GFI, goodness-of-fit index; *p*, significance *p* value; RMSEA, root mean square error of approximation; TLI, Tucker–Lewis index; $\chi^2$/df, normalised chi-square; $\chi^2$, chi-square, df, degrees of freedom.
*Source*: Authors' own data and estimations.

intervals contains the unit (Bagozzi & Yi, 1988). All the results fulfil these conditions, hence verifying the discriminant validity of the scales. Table 10 illustrates this analysis.

## 4.2 | Structural models

The hypotheses of the research were finally tested; the results are summarised visually in Figure 2. The structural model shows good fit measures, all the indices are above the minimum values recommended by Hair et al. (1999): normalised chi-square ($\chi^2$/df = 1.503), GFI = 0.974, adjusted goodness of fit index (AGFI = 0.932), CFI = 0.949, and root mean square error of approximation (RMSEA = 0.041). The estimates of the standardised coefficients ($\beta$)—which show the weights of the direct effects of one variable on another and the direction (hypothesis)—are all significant at the probability levels $p < .001$ and $p < .01$, except for the proposed relationships between social innovativeness and green innovation performance (H3), social performance (H4), and economic performance (H5); and between social proactiveness and risk-taking and innovation performance (H10), where the betas were not significant. From the coefficient $R^2$—which indicates the amount of variance of the constructs

**TABLE 6** Reliability and confirmatory factor analysis

| Scales | Scale items | $\beta$ | CR | AV | Confirmatory factory analysis (First order) Composite reliability test |
|---|---|---|---|---|---|
| *Social innovativeness* (Cronbach's $\alpha$: .810) | SI1 | .910 | 0.92 | 0.79 | $\chi^2$(df5) = 79.697 ($p$ = .000), GFI = 0.951, AGFI = 0.910, CFI = 0.956, RMSEA = 0.074, Normalised $\chi^2$ ($\chi^2$/df) = 2.657 |
| | SI2 | .936 | | | |
| | SI3 | .725 | | | |
| *Social proactiveness and risk-taking* (Cronbach's $\alpha$: .825) | RPS1 | .700 | 0.87 | 0.49 | |
| | RPS2 | .622 | | | |
| | RPS3 | .772 | | | |
| | RPS4 | .594 | | | |
| | RPS5 | .729 | | | |
| | RPS6 | .696 | | | |
| | RPS7 | .772 | | | |

*Note*: The detailed list of scale items can be found in Table S1. $p$ < .001
Abbreviations: AV, average variance; CR, composite reliability; $\beta$, standard regression weight.
*Source*: Authors' own data and estimations.

**TABLE 7** Descriptive findings and exploratory factor analysis (reliability and validity of scales)

| Constructs included in SEM | Scale items | Mean | SD | Exploratory factor analysis (loadings) Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|---|---|---|
| *Economic performance* (Cronbach's $\alpha$: .750) | EP1 | 4.81 | 0.84 | 0.580 | | |
| | EP2 | 4.81 | 0.84 | 0.767 | | |
| | EP3 | 4.61 | 1.18 | 0.658 | | |
| | EP4 | 4.78 | 0.89 | 0.773 | | |
| | EP5 | 4.86 | 0.71 | 0.675 | | |
| *Green innovation performance* (Cronbach's $\alpha$: .887) | GP1 | 4.13 | 0.90 | | 0.903 | |
| | GP2 | 4.16 | 0.88 | | 0.912 | |
| | GP3 | 4.11 | 0.87 | | 0.771 | |
| | GP4 | 3.95 | 1.07 | | 0.725 | |
| | GP5 | 4.21 | 0.88 | | 0.542 | |
| | GP6 | 4.02 | 1.10 | | 0.562 | |
| | GP7 | 4.10 | 1.11 | | 0.561 | |
| | GP8 | 3.87 | 1.18 | | 0.709 | |
| *Social performance* (Cronbach's $\alpha$: .812) | SP1 | 3.99 | 1.08 | | | 0.747 |
| | SP2 | 3.96 | 1.11 | | | 0.834 |
| | SP3 | 4.09 | 1.00 | | | 0.869 |
| | SP4 | 4.09 | 1.00 | | | 0.812 |
| *Eigen value* | | | | 4.405 | 25.909 | 25.909 |
| *% Explained variance factor* | | | | 2.990 | 17.591 | 43.500 |
| *% Cumulative explained variance* | | | | 2.981 | 17.538 | 61.038 |
| *Bartlett's test of sphericity* | $\chi^2$(sig.): 3182.228 (0.000) | | | | | |
| *Kaiser–Meyer Olkin index* | KMO: 0.848<br>Measure of simple adequacy: (0.927–0.866)<br>% Variance: 61.038 | | | | | |

*Note*: The Bartlett's test of sphericity and the Kaiser–Meyer Olkin index show if the data obtained through the questionnaire is adequate to perform factor analysis. Their requirements are: Bartlett's Sphericity test $\chi^2$ (sig <.05), KMO >0.7 median and KMO >0.8 good, MSA = unacceptable for values below 0.5. The detailed list of scale items can be found in Table S1.
*Source*: Authors' own data and estimations.

**TABLE 8** Fit indices for the models

| Models | $\chi^2$ | df | $\chi^2$ (df) | *p* | GFI | AGFI | TLI | CFI | RMSEA |
|---|---|---|---|---|---|---|---|---|---|
| *Model 1* (1 variable, 17 items) | 1542.597 | 119 | 12.963 | .000 | 0.508 | 0.367 | 0.478 | 0.543 | 0.199 |
| *Model 2—First order* (3 variables, 17 items) | 648.968 | 116 | 5.595 | .000 | 0.761 | 0.6384 | 0.799 | 0.829 | 0.124 |
| *Model 3—Respecified Model 2* (3 variables, 15 items) | 186.829 | 73 | 2.559 | .000 | 0.918 | 0.883 | 0.945 | 0.956 | 0.072 |
| *Model 4—Second order, respecified Model 2* (4 variables, 15 items) | 191.983 | 72 | 2.666 | .000 | 0.915 | 0.876 | 0.941 | 0.953 | 0.074 |

Abbreviations: AGFI, adjusted goodness of fit index; CFI, comparative fit index; df, degrees of freedom; GFI, goodness-of-fit index; *p*, significance *p* value; RMSEA, root mean square error of approximation; TLI, Tucker–Lewis index; $\chi^2$/df, normalised chi-square; $\chi^2$, chi-square.
*Source*: Authors' own data and estimations.

**TABLE 9** Reliability and confirmatory factor analysis

| Scales | Scale items | $\beta$ | CR | AV | Confirmatory factory analysis<br>Composite reliability test |
|---|---|---|---|---|---|
| *Economic performance* (*EP*) (Cronbach's $\alpha$: .750) | EP1 | .488 | 0.82 | 0.48 | $\chi^2$ (df5) = 186.829 ($p$ = .000), GFI = 9.918, AGFI = .883, CFI = .653, RMSEA = .072, Normalised $\chi^2$ ($\chi^2$/df) = 2.559 |
| | EP2 | .696 | | | |
| | EP3 | .524 | | | |
| | EP4 | .804 | | | |
| | EP5 | .634 | | | |
| *Green innovation performance* (*GIP*) (Cronbach's $\alpha$: .887) | GP1 | .979 | 0.87 | 0.60 | |
| | GP2 | .998 | | | |
| | GP3 | .708 | | | |
| | GP4 | .598 | | | |
| | GP8 | .560 | | | |
| *Social performance* (*SP*) (Cronbach's $\alpha$: .812) | SP1 | .743 | 0.87 | 0.62 | |
| | SP2 | .841 | | | |
| | SP3 | .834 | | | |
| | SP4 | .779 | | | |

*Note*: The detailed list of scale items can be found in Table S1. $p < .001$.
Abbreviations: AV, average variance; CR, composite reliability; c, standard regression weight.
*Source*: Authors' own data and estimations.

that is explained by the model—, it is observed that the model explains 83.8% of the green innovation performance variable; however, it explains only 25.5% of social performance and 13.4% of economic performance.

Table 11 shows a summary of the hypotheses tested.

## 5 | DISCUSSION

The $R^2$ obtained in the structural model (Figure 2) shows a strong explanatory power of the theoretical model on the green innovation performance construct ($R^2 = .838$); in contrast, the explanatory power of economic and social performance was rather weak (.134 and .255 respectively). Regarding the competences for sustainable entrepreneurship, the research concluded that these are a four-dimensioned variable, with three out of the four dimensions having a strong explanatory power: systems-thinking competence ($R^2 = .563$), normative competence (.814) and interpersonal competence (.553). In turn, the action competence dimension did not stand out at explaining the results of the model (.269).

A direct —though weak— influence was observed from the leader's sustainability competences to social innovativeness (H1) ($\beta = .231$, $p < .001$) and to social proactiveness and risk-taking (H2) ($\beta = .224$, $p < .001$). Other studies have found evidence in favour of the relationship between entrepreneurship skills (entrepreneurship education) and the entrepreneurial orientation (EO) dimensions (Marques et al., 2018; Wickramaratne et al., 2014), although not specifically in the context of this research (SEO).

Taking into account the standardised coefficients ($\beta$) and their significance ($p$) at the .001 and .01 levels, all the hypotheses regarding performance constructs are supported, with the exception of H3, H4, and H5. In other words, social innovativeness does not directly influence green innovation performance (H3), social performance (H4) or economic performance (H5); but instead, it does so indirectly through

**TABLE 10** Correlation matrix and discriminant validity

| Scales | Square root AV | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|---|
| *Action competence* (1) | 0.71 | **0.834**[a] | 0.530[b] | 0.479 | 0.340 | 0.262 | 0.380 | 0.339 | 0.245 | 0.169 |
| *Systems-thinking competence* (2) | 0.76 | | **0,887** | 0.674 | 0.556 | 0.156 | 0.306 | 0.238 | 0.258 | 0.287 |
| *Normative competence* (3) | 0.81 | | | **0.859** | 0.674 | 0.219 | 0.291 | 0.222 | 0.211 | 0.218 |
| *Interpersonal competence* (4) | 0.78 | | | | **0.788** | 0.159 | 0.260 | 0.188 | 0.170 | 0.232 |
| *Social innovativeness* (5) | 0.88 | | | | | **0.810** | 0.568<br>0.096[c]<br>(0.224–0.396) | 0.523 | 0.300 | 0.277 |
| *Social proactiveness and risk-taking* (6) | 0.70 | | | | | | **0.825** | 0.916 | 0.477 | 0.365 |
| *Green innovation performance* (7) | 0.77 | | | | | | | **0.887** | 0.409<br>0.060<br>(0.150–0.342) | 0.214<br>0.024<br>(0.108–0.204) |
| *Social performance* (8) | 0.78 | | | | | | | | **0.812** | 0.327<br>0.014<br>(0.064–0.176) |
| *Economic performance* (9) | 0.69 | | | | | | | | | **0.750** |

*Note*: All significant at $p$ value <.01.

*Source*: Authors' own data and estimations.

[a]Cronbach's $\alpha$'s for each scale, which should be higher than the correlation between that scale and the other scales are shown in bold on the main diagonal.

[b]Inter-scale correlation; should be less than the square root of the average variance extracted.

[c]The squared correlation between pairs of factors should be less than the AV, and the confidence interval for the estimated correlations should be twice the SE; it does not include the value of 1.

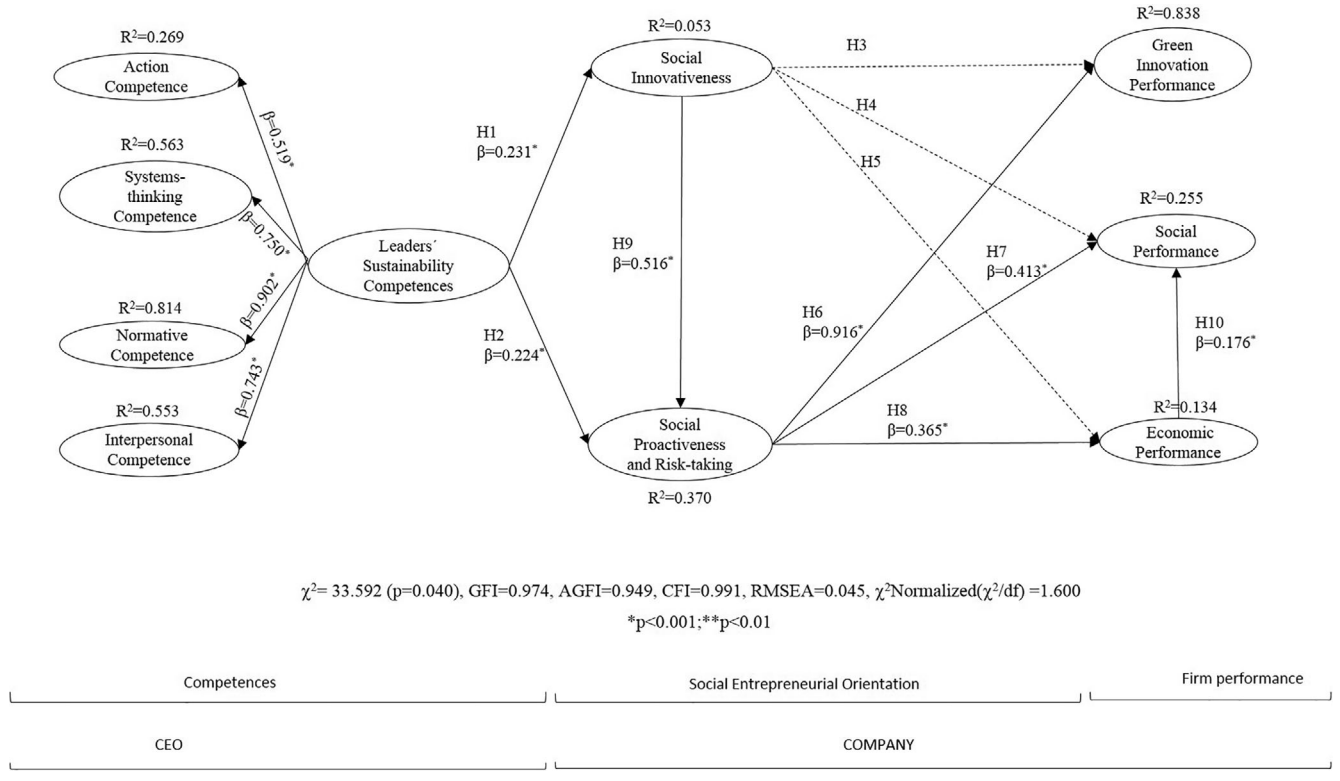


**FIGURE 2** Structural model. *Source*: Authors' own design based on estimation results

**TABLE 11** Hypotheses tested

| Construct | Hypotheses |
|---|---|
| Social innovativeness ← Leaders' sustainability competences | H1 corroborated |
| Social proactiveness and risk-taking ← Leaders' sustainability competences | H2 corroborated |
| Green innovation performance ← Social innovativeness | H3 not corroborated |
| Social performance ← Social innovativeness | H4 not corroborated |
| Economic performance ← Social innovativeness | H5 not corroborated |
| Green innovation performance ← Social proactiveness and risk-taking | H6 corroborated |
| Social performance ← Social proactiveness and risk-taking | H7 corroborated |
| Economic performance ← Social proactiveness and risk-taking | H8 corroborated |
| Social proactiveness and risk-taking ← Social innovativeness | H9 corroborated |
| Social performance ← Economic performance | H10 corroborated |

*Source*: Authors' own data.

social proactiveness and risk-taking. In fact, social proactiveness and risk-taking have a direct influence on green innovation performance (H6) ($\beta = .916$, $p < .001$), social performance (H7) ($\beta = .413$, $p < .001$) and economic performance (H8) ($\beta = .365$, $p < .001$). Hence, this is the only construct that directly influences the performance of SMEs, which leads to weight an additional hypothesis (H9): that social innovativeness has only an indirect influence through the social proactiveness and risk-taking construct ($\beta = .516$, $p < .001$).

Following this line of thought, it is worth noting the emergence of two causal relationships that were not initially raised in this research, but that find support in the study of Altinay et al. (2012) and in the one by Aldás-Manzano et al. (2009). The first of these two causal relationships is captured by hypothesis nine (H9), which relates social innovativeness with social proactiveness and risk-taking and shows that the former has moderate influence on the latter in the results ($\beta = .516$, $p < .001$). H9 is in line with the findings by Altinay et al. (2012, p. 492), who support the idea that innovativeness has a relationship with social risk-taking, stating that "innovation itself includes a risk element due to the uncertainty surrounding the innovation activity". The second causal relationship is captured by hypothesis 10 (H10), which relates economic performance with social performance and show a very weak influence on the results ($\beta = .176$, $p < .001$). This reinforces evidence collected in the research of McGuire et al. (1988), and in Waddock and Graves (1997), in the direction that a better economic performance results in a better social performance.

The results of this research are also consistent with those found in other studies. For example, Alegre and Chiva (2013) found a relationship between entrepreneurial orientation and innovation performance and firm performance. Arshad et al. (2014) gathered empirical evidence for the relationship between social innovativeness, social proactiveness and risk-taking, and economic performance. In this regard, there are extensive studies that show positive outcomes for the relationship (Chow, 2006; Coulthard, 2007; Jantunen et al., 2005; Keh et al., 2007; Lee et al., 2001; Madsen, 2007; Wiklund & Shepherd, 2005; among others).

## 6 | CONCLUSIONS AND IMPLICATIONS

This research aimed to analyse the structure of relationships between a leader's sustainability competences, the company's SEO and the firm's performance in SMEs. The following questions were then posed: How do the leader's sustainable competencies influence the SEO of SMEs? Does social orientation entrepreneurship have a positive influence on the performance of SMEs?

The work developed here made it possible to observe that leaders should be trained in specific key competencies for the company to have a sustainable and social orientation, that is, to be sensitive to environmental and social practices. These skills can be grouped in four dimensions: systems-thinking and foresight thinking competences; normative competences; interpersonal competences; and action competences. Therefore, leaders must be trained with the objective of acquiring skills and competences in integrated systems analysis, in applying and reconciling the values, principles and goals of sustainability with internal and external stakeholders, and in promoting teamwork and alliances; as well as with the aim of acquiring the necessary competences to expand their capability to actively engage in responsible actions to improve sustainability. Nevertheless, from the predictive capacity of the dimensions of SEO, it is evident that the leader's sustainability competences will not be the only relevant skills.

Through the SEO, the leader's acquired competences have an influence on the company's performance, especially in green innovation performance and, to a lesser extent, in economic and social performance—given that the predictive capacity of these factors turned out to be low. All of this shows that the competences for sustainable entrepreneurship, as an antecedent for SEO, have a decisive influence on green innovation performance; that is, green products or green processes, innovation in energy-saving technologies, pollution prevention, waste recycling, green product designing, and corporate environmental management (Chen et al., 2006). It was also observed that the influence occurs mainly through the social risk propensity and proactivity dimension, and not so much through social

innovation—the company's tendency to promote new ideas and processes with social impact.

In sum, the competences acquired by leaders are essential for generating strong social proactivity in the company, as they will make it possible to anticipate future social demands over time and to identify market needs in advance. In the same line, these competences are essential to favour leaders' social risk-taking, as well as their ability to make decisions under situations of uncertainty where social impact is free to outweigh the search for economic benefits for the company.

The results provide an important implication in the sense that if the company wishes to follow a vision of social and sustainable development and improve its green innovation performance, it must rely on leaders focused on sustainability as key agents of change to improve society. For this, training in the specific competences for sustainable development here presented will be essential. In this sense, the knowledge, skills and attitudes of leaders to manage sustainable development are necessary (Ploum et al., 2018). Thus, higher education institutions become the key piece for the acquisition and development of competencies by leaders for sustainability, being necessary for this in many cases to adjust and reformulate educational programs to facilitate the development of leadership in sustainability. The three main limitations of this work are the usual ones related to cross sectioning, since the research was done at a specific moment in time, and with the use of a structured questionnaire. The third limitation refers to the specific characteristics of the analysed sector (tourism sector and formed by SMEs), the generalisation of the conclusions must be analysed with caution.

## CONFLICT OF INTEREST

The authors declare no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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