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Research Article

Green Start-Ups' Attitudes towards Nature When Complying with the Corporate Law

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This paper examines how Spanish green start-ups develop improved attitudes towards nature. Despite the prevalence of theories based on green entrepreneurs, very little research has been conducted on how green attributes influence nature in the framework of the new Spanish Criminal Code in what concerns corporate compliance. One hundred and fifty-two start-ups were interviewed in 2018. Smart PLS Path Modelling has been used to build an interaction model among variables. The results obtained have a significant theoretical and practical implication since they add new findings to the current literature on how start-ups incorporate the recent Criminal Code in their environmental decisions. The model reveals a strong predictive power (R-squared = 77.9%). There are grounds to say that start-ups should implement effective monitoring systems and new organisational standards, in addition to developing surveillance measures to avoid unexpected sanctions.

1. Introduction

The paper delves into green entrepreneurs' attitudes in start-ups when complying with the environmental law in the context of the recent Spanish Criminal Code in what concerns corporate compliance. Regulative compliance explains the aim that organisations want to reach in their efforts to comply with environmental regulations.

It is estimated that 99.9% of Spanish organisations are SMEs, which means that there are 2,498,870 SMEs in Spain capable of delivering more sustainable goods and services through organic food production, fair trade, natural and handmade craft, sustainable tourism services, environmental consulting, green energy firms, etc. [1].

Spain has implemented several policies to enhance entrepreneurship in the past decades. Businesses are required to develop rapidly, reduce unemployment rates, and improve the deteriorated economy without harming the environment [1].

Since Brundtland wrote Our Common Future (1987) [2], companies have been aided to delve into the needs of the current time. It is proposed to look after the future generations in order to meet their own demands in their development efforts. The sustainable argument in reduced companies has gradually expanded [3] and is supported by empirical studies [4].

For decades, the emerging literature on green entrepreneurship in small companies has focused on environmentally oriented entrepreneurship achieving sustainable development [5]. The evolution of green entrepreneurs has recently translated into the appearance of many green start-ups in a wide variety of sectors, business strategies, and marketing targets. These entrepreneurs have created products and services to meet Green Opportunities and benefit nature at the same time [6]. Ivanko [7] added the social dimension linked to the environment to ascertain the problems suffered by the community. Social entrepreneurship brings a range of new social values to profits, environment, and fair trade [8].

Even though there is no agreement on the definition of green entrepreneurs [9], they are viewed by scholars as companies with the predisposition to pursue potential opportunities that produce both economic and ecological benefits through green activities.

Their green market orientation has defined their dual identity [10]. Thus, profit and environment may compete on equal terms. As for the way green companies operate in the market, their environmental orientation reflects green innovativeness, market proactiveness, and risk-taking [11, 12].

Considering these features, Walley and Taylor [13] highlighted three pillars of green entrepreneurs as three key features of sustainable development: economic prosperity based on the balance between economy and environment, the pursuit of environmental quality to protect nature through innovative and competitive processes, and the social and ethical consideration of the business culture focused on promoting Green Opportunities among companies.

Based on the literature review, four attributes were extracted from these pillars to define a model for creating environmental value for green start-ups [14, 15]. These attributes are Balanced Green Investment [16], environmental impact of green entrepreneurs [4, 17, 18], innovation and competitiveness [19–21], and Green Opportunities [22].

The attributes had to be assessed since a new regulatory compliance emerged in 2015 in Spain [23]. The new legal perspective relies on regulation and public concern to overcome substantial damage to the quality of air, soil or water, animals, or plants. In the context of the regulatory framework, effective monitoring systems not only improve the organisational management but also avoid unexpected sanctions [24].

The contribution of this paper is threefold: (1) it tries to ascertain whether the Environmental Value Model is empirically reflected in these attributes and validate the different opportunities for green start-ups; (2) it analyses whether the recent Spanish regulatory compliance influences green start-ups not only by imposing coercive rules but also by allowing them to design organisational norms of surveillance [25]; and (3) it explores whether the new regulatory compliance scenario affects green entrepreneurs' attitudes towards nature.

The relation between green entrepreneurs' attitudes and the recent pressure exerted by the Spanish regulatory compliance appears not to have been considered by green entrepreneurs. As a result, the paper examines what role green start-ups play in the new legal framework when complying with the Corporate Law to protect nature.

One hundred and fifty-two environmental green start-ups were involved in the study. The data collected was processed using SEM-PLS Path Modelling. Theoretical and practical implications were provided not only for environmental authorities but also for green entrepreneurs when avoiding unlawful environmental activity that damages nature. The research conducted further adds content to the current literature, particularly, about the findings of green start-ups when incorporating related measures into their organisational decisions.

The paper is structured as follows. First, green entrepreneurship is studied in the context of Spanish regulatory compliance, and then an Environmental Value Model for green entrepreneurs is proposed. In third place, the methodology used for this paper is explained. Fourth, results are drawn from the data collected. Finally, the discussion, conclusions, and limitations are presented.

2. Literature Review

2.1. Green Entrepreneurship in the Context of Spanish Regulatory Compliance

H_1: Environmental Corporate Compliance (ECC) Positively Influences Green Attitudes towards Nature (GAN) among Entrepreneurs. Since the industrial degradation occurred, environmental entrepreneurs emerged quite rapidly as new companies in the environmental sector and, more recently, as green start-ups [26]. Sustainable research in the field of entrepreneurship becomes crucial to avoid threats to nature [27]. In this framework, entrepreneurs have constantly desired to minimise their impact on the environment [28] seeking solutions to align economy with ecology [16]. The proposal is structured in ongoing process of improved actions and attitudes connected to the emerging environmental opportunities through organisational discoveries [9].

However, since the Spanish regulatory compliance emerged in 2015, a new perspective to deter environmental damage has been developed. The first environmental concern for nature came with the Spanish Constitution [29] and, later, the Spanish Criminal Code of 1983.

Administrative sanctions were established for individuals who committed unlawful environmental activities, such as causing emissions, discharges, extractions or excavations, vibration, injections, or deposits, in the atmosphere, soil, or terrestrial and marine waters (Article 173.1) [29].

Fortunately, the rules and regulations have gradually increased their protection over environment. The purpose has been to make an inhabitable environment place to live as well as to raise green awareness of sustainable principles among decision-makers [30].

To date, most ethical endeavour to defend the environment has not been consistent enough to adequately address environmental threats [31].

With the reform of the Spanish Corporate Governance Code [23] judges were allowed to hear cases not only about individuals having committed unlawful acts, but also about companies. The legal reform was based on transferring to companies the same rights and obligations as individuals. Although individuals are typically liable for committing environmental crimes towards nature, liability can now be transmitted to the enterprise (vicarious liability) [32].

On the one hand, the new legal framework is more severe than the previous one due to the new obligation for companies to comply with the Criminal Code and on the other hand, the legal reform allows companies to avoid sanctions by developing surveillance and control measures [23]. Such organisational standards must prevent information bias and foster green attitudes towards nature [33].

The strategy used to comply with this law should be designed through innovation and the creation of a specific department to deliver organisational measures [34, 35].

The process, however, requires developing surveillance protocols through innovation and creation procedures [36]

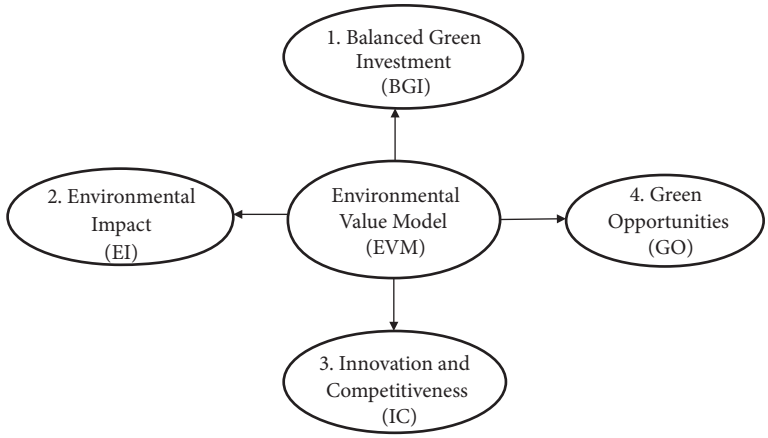

Figure 1: Environmental Value Model (EVM).

to balance companies' economic and ecologic activities [16]. Protocols alert green entrepreneurs about the risks that companies could be facing when their workers behave irresponsibly towards nature [37], which entails the company being seen as carrying out nonenvironmental and illegal activities [38].

H_2: Environmental Corporate Compliance (ECC) Positively Influences the Environmental Value Model (EVM). This new culture promoted by law has led to a new behavioural model that adds value to companies. The EVM prevents companies not only from committing unlawful environmental activity [39] but also from performing incorrect environmental procedures and the underlying uncertainty of reducing the risk of negative implications for nature [4].

Likewise, the preventive activities of the EVM for regulatory compliance require frequent assessment by establishing standards of procedures to ensure being up to date in the event of irresponsible behaviours leading to environmental crimes [40]. Moreover, it is also essential to settle disciplinary procedures through sanctions and prevent illegal conduct along the creation and innovation process [41].

Organisational standards of procedures are key factors of the environmental model. They have to be established by the compliance officer [42]. Such rules not only have to be supervised periodically [43] but also have to be communicated to the employees, e.g., by training programmes or spreading publications to explain these items and detect possible unlawful conduct empirically.

The following organisational decisions must be made in companies in their endeavour to comply with legal requirements, according to the Spanish Corporate Governance Code [23].

(i) A department must be created to supervise the compliance of green innovations, procedures, and services [34]. This department should establish a management model to avert unlawful environmental actions and allocate a corporate budget for surveillance practices within the company [44].

(ii) Training programmes on the protocols or procedures must be taught to appropriately implement surveillance measures in companies [36]. Protocols must be designed to report any prior unlawful behaviour within the company [38] and reveal any necessary changes to maintain legality in every business activity [40].

(iii) A disciplinary system must be implemented to address unlawful environmental actions and also the financial, managerial, and social obligations with the company and society [41].

For the three steps to be put into effect, recent corporate laws have enhanced several transparency and cooperation models within companies that have added value to environmental companies.

2.2. Environmental Value Model for Green Entrepreneurs (EVM)

H_3: The Environmental Value Model (EVM) Positively Influences Green Attitudes towards Nature (GAN). Innovations and business models have added increasing value to companies in the past decades. Emerging sustainable approaches such as fair trade, circular economy, or lowsumerism, have set up new trends [45] in response to demanding green consumers [46].

These models require defining key attributes to ascertain practical consequences in green entrepreneurs. Four attributes have been extracted from the literature review in this respect: (1) Balanced Green Investment, (2) environmental impact of green entrepreneurs, (3) innovation and competitiveness, and (4) Green Opportunities.

The contribution of this model is twofold: first, to find a predictive green model to delve into the empirical implications for Spanish green start-ups and, second, to analyse whether the balance between economy and sustainability is empirically relevant for Spanish green start-ups. Figure 1 shows the attributes of the model.

H_4: The Environmental Value Model (EVM) Positively Influences Balanced Green Investment (BGI). According to the OECD [47] sustainability creates conditions in which individuals and environment interact harmoniously. Sustainability allows reaching environmental, economic, and social standards to respect future generations.

In the context of environmental deterioration, sustainable management has become a pivotal issue [48]. Even though literature about damaging environmental outcomes is vast, there is a widespread ignorance towards the positive initiatives taken by green entrepreneurs to address such damage. Such ignorance is due to failures in coordinating expectations and preferences throughout the business models to reduce the actual high cost for companies [49]. Green models have introduced potential opportunities to produce both economic and ecological benefits through eco-friendly products and services [50]. How these green models influence environmental and financial performance remains unclear. While some studies have found a negative relationship between tangible-external green strategies and entrepreneurial performance [51], the impact of green entrepreneurship performance has also been positive in some cases [16].

The balance between investment for profit and to protect nature largely depends on the responsible performance of green entrepreneurs [52] and the voluntary disclosure of environmental standards [53]. Developing managerial standards to have a positive impact on the environment is precisely one of the core concepts of the Spanish regulatory compliance.

H_5: The Environmental Value Model (EVM) Positively Influences Innovation and Competitiveness (IC). The Environmental Value Model (EVM) is also associated with three features of entrepreneurs: innovativeness, proactiveness, and risk-taking [19].

First, innovativeness describes a tendency to deliver new ideas, engage in experimentation, and support creative processes. Innovation enables entrepreneurs to combine resources to launch new products or processes [20], to gain advantages over competitors [54], and to differentiate themselves from others [21]. Competitive advantages can also enhance companies' absorptive capacity by developing their ability to imitate advanced green technologies [55].

Second, proactiveness refers to the capacity to respond to customer needs by introducing green products, services, or technology [21]. Companies are facing growing pressure from customers with raising awareness of environmental issues. Proactive companies are likely to respond more quickly to the needs of customers than their competitors. Under the trend of customers' attitude towards green marketing, companies can reap the financial benefits of becoming a pioneer in green innovation practices.

Third, risk-taking is one of the primary personal attributes of entrepreneurs and it reflects the tendency to adopt an active stance when investing in projects [56]. Although the propensity of risk may bring fresh revenue, it is often associated with complex situations and uncertainties that can entail companies becoming trapped in changing circumstances [57].

H_6: The Environmental Value Model (EVM) Positively Influences Environmental Impact (EI). Green entrepreneurial activity can simultaneously foster economic and ecological benefits for society, by creating market opportunities and preventing environmental degradation [58] in two different ways. First, the entrepreneurial action may reduce environmental degradation and capture economic value by alleviating market failure [4] and using green technologies to decrease the consumption of water, electricity, coal, or oil [17]. Second, green entrepreneurs can reduce unhealthy damage to employees at work by decreasing the consumption of toxic substances [18] and protecting nature by applying corporate tax incentives to green companies [59].

H_7: The Environmental Value Model (EVM) Positively Influences Green Opportunities (GO). One way of building opportunities to expand environmental values within the company is by developing employee's green skills [22].

According to TECCe's argument, Green Opportunities facilitate the generation of new product processes [21]. Assessing potential opportunities and adopting eco-friendly technologies could very much help to overcome environmental market failures [60]. The electrical utility industry, for instance, has the possibility of taking more advantage out of wind power [10] and to make more green use of natural resources [61].

After describing the four green attributes that form the Environmental Value Model, the paper turns to the analysis of the methodology, results, discussion, and conclusions.

3. Research Methodology

3.1. Data Collection and Sample. The lack of an official list of Spanish environmental start-ups has hampered our endeavour to list and collect the data of SMEs. The research team chose green start-ups for two reasons: (1) The number of green start-ups has recently increased in Spain, and they are becoming a new phenomenon of environmental awareness and (2) given the lack of studies in the context of the recent Spanish regulatory compliance, this paper helps to shed light on the role green start-ups play and how the new regulation affects them.

242 online environmental green start-ups were initially identified in Spain. Following the literature review, the focus has been on those who met the four attributes. Thus, the first step was to ensure that green start-ups indeed complied with those attributes and for this; the answers to four questions were required:

(i) Balanced Green Investment (BGI): does your company seek a balance between economic and environmental aims?

(ii) Innovation and Competitiveness (IC): has your company implemented innovative green ideas and practices in the market?

(iii) Environmental Impact (EI): has your company implemented green technologies to prevent contributing to the environmental degradation of nature?

Table 1: Online environmental startups in Spain.

Sector	Population	Sample	Sector	Population	Sample
Agriculture	2	1	Fashion	3	3
Art	4	4	Finance	4	3
Automotive	4	4	Food	9	7
Clean Technology	15	11	Funeral Industry	1	1
Construction	3	3	Health and Wellness	10	9
Consulting	11	12	Health Care	2	2
Cosmetic	4	4	Human Resources	1	1
Design	10	9	Information Technology	15	10
Digital Marketing	2	2	Internet of things	5	4
E-commerce	8	8	Life Sciences	1	1
Education	6	5	Logistic	4	3
Electric bicycle	4	3	Nature	7	6
Energy	14	10	Restaurants	11	7
Entertainment	4	2	Travel	16	9
Events	3	2	Urban development	3	2
Farming	3	2	Water	3	2
Total	97	82	Total	95	70
Total Population	192		Total Sample	152	

(iv) Green Opportunities (GO): does your company identify the Green Opportunities that the market offers?

A brief presentation of the aims of the research was also sent to them in the context of the Spanish Corporate Governance Code [23] in what concerns corporate compliance. Two hundred and twelve start-ups answered and asserted complying with the four attributes. The survey was sent to them, and one hundred fifty-two companies returned the survey with their answers. The team then emailed the compliance officers and several heads of departments between June and August 2018 requesting they answer the survey. The structure and distribution of the population under study and the sample are explained in Table 1.

3.2. Surveys. According to the literature review, a survey was drafted to measure green entrepreneurs' attitudes towards nature empirically. Twenty statements were completed.

Two focus groups held online meetings via Skype to validate the survey. Skype was used to overcome the distance between participants. Nine green entrepreneurs from different areas of Spain were involved. Twenty original questions were discussed during a period of two hours in each meeting. The survey was amended as a result. Five of the original items were deleted and two added. With this information, an experiential survey was conducted to validate the proposed survey. Six interviews were made to contrast the clarity of the questions. Three questions were further modified after the pretest. The final survey is shown in Table 2.

The items were analysed through the ten-point Likert scale to indicate the degree of importance of the factors (1 = "fully disagree" to 10 = "fully agree") (Allen and Seaman, 2007).

3.3. Model and Data Analysis Process. SEM-PLS Path Modelling was used to ascertain the model and obtain results [62]. SEM not only enables examining the relationships between observable indicators and constructs statistically [63], but also works with composite model latent variables [62]. The methods can be used for explanatory and predictive research as well as complex models.The green start-up model is composed of three endogenous constructs, the Environmental Value Model (EVM), Green Attitude towards Nature (GAN), and Environmental Corporate Compliance (ECC), and four exogenous ones, Balanced Green Investment (BGI), Innovation and Competitiveness (IC), Environmental Impact (EI), and Green Opportunities (GO), (see Figure 2).

Seven hypotheses were analysed in the study:

H_1: Environmental Corporate Compliance (ECC) positively influences Green Attitudes towards Nature (GAN) among entrepreneurs.

H_2: Environmental Corporate Compliance (ECC) positively influences the Environmental Value Model (EVM).

H_3: the Environmental Value Model (EVM) positively influences Green Attitudes towards Nature (GAN).

H_4: the Environmental Value Model (EVM) positively influences Balanced Green Investment (BGI).

H_5: the Environmental Value Model (EVM) positively influences Innovation and Competitiveness (IC).

H_6: the Environmental Value Model (EVM) positively influences Environmental Impact (EI).

H_7: the Environmental Value Model (EVM) positively influences Green Opportunities (GO)

Table 2: Latent variables and the elaborated questionnaire.

Latent variables	Questions
GAN: Green Attitudes towards Nature	Do you think it is important for your company to be aware of being an appropriate steward of natural resources (GAN_1)? Do you think it is important for your company to reduce hazardous emissions or toxic materials to improve health and safety at work (GAN_2)?
ECC: Environmental Corporate Compliance	Do you think it is important to implement the prevention model to supervise the compliance of green innovations and procedures and services with the law (ECC_1)? Do you think it is important to undertake protocols and training procedures for staff members to apply these surveillance and organisational measures (ECC_2)? Do you think it is important to establish a disciplinary system to prevent non-compliance with the law (ECC_3)?
The Environmental Value Model (EVM).	Do you think it is important to build entrepreneurial models to create environmental values based on sustainable principles (EVM_1)? Do you think it is important to describe, analyse and communicate such values in your company (EVM_2)?
Balanced Green Investment(BGI)	Do you think it is important to seek a balance between profit, nature and people through sustainable management to protect nature (BGI_1)? Do you think it is important to reach environmental, economic and social standards to respect future generations in an innovation context (BGI_2)?
Environmental Impact (EI)	Do you think it is important to produce green technologies to prevent environmental degradation on the planet (EI_1)? Do you think it is important to reduce the consumption of toxic substances and harmful emissions to prevent damages to the health and safety of employees at work (EI_2)?
Green Opportunities (GO)	Do you think it is important to develop green skills among employees to build opportunities to expand environmental values in the company (GO_1)? Do you think it is important to implement a new generation of manufacturing processes to reduce pollution in production (GO_2)? Do you think it is important to implement eco-friendly technologies to overcome the market failures (GO_3)?
Innovation and Competitiveness (IC)	Do you think it is important to propose new ideas and support creative processes (IC_1)? Do you think it is important to become a pioneer in green innovation ideas and practices (IC_2)? Do you think it is important to respond faster than your competitors to the needs of customers (IC_3)?

4. Results

4.1. Measurement Model. Reliability and validity are the first two conditions used to assess the model. The process can be structured in four steps: (1) individual item reliability, (2) construct reliability, (3) convergent validity, and (4) discriminant validity. First, individual reliability is measured through the load (λ) of each item. The minimum level established for acceptance as part of the construct is typically $\lambda >= 0.707$ [64]. This condition was validated in the model (see Figure 3).

Composite reliability (CR) was applied to test the consistency of the constructs. This evaluation measures the rigour with which these elements measure the same latent variable [65].

Cronbach's alpha index also determines the consistency of the model for every latent variable. Values higher than 0.7 are typically accepted [66]. Table 3 shows that the reliability of each construct was accepted.

AVE measures the convergent validity, the acceptable limit of which is 0.5 or higher. This indicator provides information about the level of convergence of the constructs with their indicators [67]. Table 3 also shows that the values meet the criteria. Rho_A was also measured. Results exceed the value of 0.7 [68].

Table 4 explains the correlations between the constructs on the left. A construct should share more variance with its indicators than with other latent variables in the model [69]. However, Henseler et al. [70] did detect a lack of discriminant validity in this respect. Ratio Heterotrait-monotrait (HTMT) provides a better approach to this indicator. The results obtained in this sense are on the right. The HTMT ratio for each pair of factors is <0.90.

4.2. Structural Model Analyses. The structural model of assessment proposed is explained in Table 5. The general criterion used to evaluate the structural model is the coefficient of determination (R-squared). R-squared analyses the proportion of variance (in percentage) in the exogenous variable that can be conveyed by the endogenous variable. The R-squared value can be expressed from 0 to 1. Values close to 1 define the predictive accuracy. Chin [71] proposed a rule of thumb for acceptable R-squared with 0.67, 0.33, and 0.19. They are defined as substantial, moderate, and weak predictive power, respectively.

Table 3: Cronbach Alpha, rho_A, Composite Reliability, and AVE.

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
ECC	0,874	0,895	0,876	0,706
EI	0,810	0,812	0,810	0,681
EVM	0,853	0,854	0,854	0,745
GAN	0,820	0,826	0,822	0,698
BGI	0,817	0,827	0,820	0,696
GO	0,849	0,853	0,848	0,651
IC	0,864	0,869	0,865	0,683

Table 4: Measurement model. Discriminant validity.

	Fornell-Larcker Criterion							Heterotrait-monotrait ratio (HTMT)						
	ECC	EI	EVM	GAN	BGI	GO	IC	ECC	EI	EVM	GAN	BGI	GO	IC
ECC	0,840													
EI	0,644	0,825						0,655						
EVM	0,697	0,730	0,863					0,694	0,729					
GAN	0,793	0,557	0,830	0,836				0,793	0,561	0,832				
BGI	0,703	0,406	0,780	0,745	0,834			0,712	0,408	0,783	0,760			
GO	0,456	0,491	0,773	0,557	0,571	0,807		0,452	0,494	0,770	0,562	0,576		
IC	0,499	0,268	0,597	0,652	0,550	0,552	0,826	0,496	0,269	0,599	0,652	0,557	0,556	

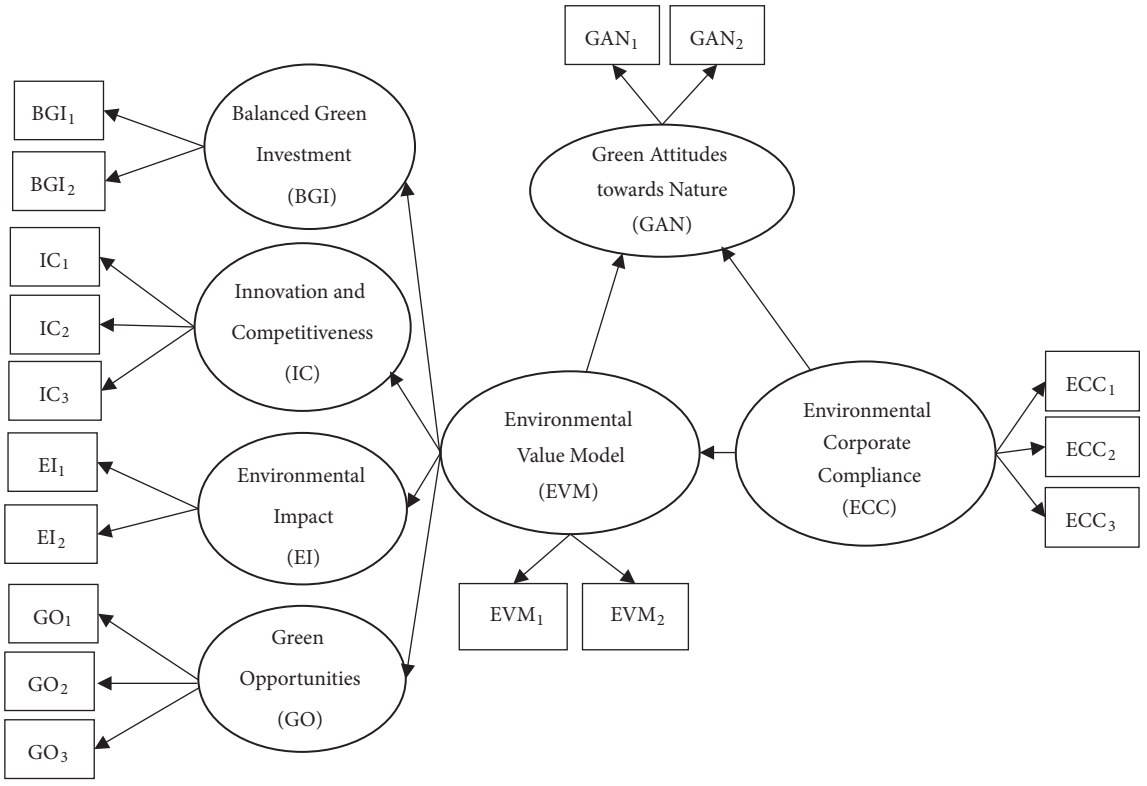

Figure 2: Conceptual scheme of the structural equation model utilized. BAN: Green Attitudes towards Nature. ECC: Environmental Corporate Compliance. EVM: Environmental Value Model. BGI: Balanced Green Investment. EI: environmental impact. IC: innovation and competitiveness. GO: Green Opportunities. EP: Educational Process.

Table 5: Comparison of hypothesis.

Hypotheses	Effect	Path coefficient (β)	Confident Interval (2.5%)	Confident Interval (95%)	t-statistic (β/STDEV)	p-Value	Supported
H1	ECC⟶ GAN	0.417	0,096	0,665	5.116	0,009	Yes ∗∗
H2	ECC ⟶ EVM	0.697	0,551	0,825	2.905	0,000	Yes ∗ ∗ ∗
H3	EVM ⟶ GAN	0.539	0,288	0,864	4.760	0,001	Yes ∗∗
H4	EVM ⟶ BGI	0.780	0,673	0,878	6.375	0,000	Yes ∗ ∗ ∗
H5	EVM ⟶ IC	0.597	0,462	0,727	2.737	0,000	Yes ∗∗
H6	EVM ⟶ EI	0.730	0,548	0,873	8.395	0,000	Yes ∗ ∗ ∗
H7	EVM ⟶ GO	0.773	0,692	0,850	4.476	0,000	Yes ∗∗

Note. For n = 5000 subsamples, for t-distribution (499) Students in single queue: ∗ p < 0.05 (t (0.05;499) = 1.64791345); ∗∗ p < 0.01 (t(0.01;499) = 2.333843952); ∗ ∗ ∗ p < 0.001 (t(0.001;499) = 3.106644601).

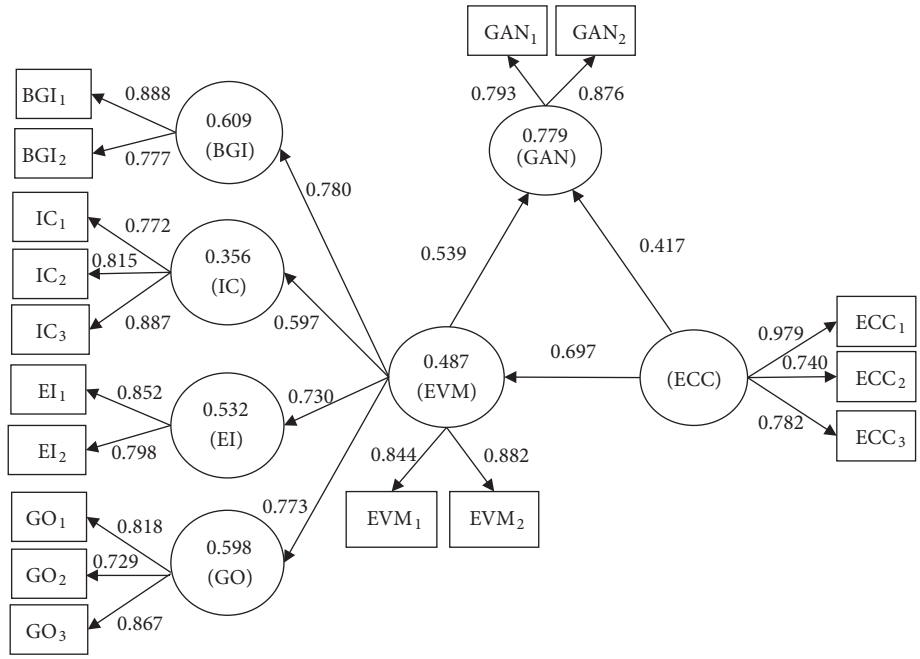

Figure 3: Individual item reliability.

Our model presents constructs with high predictive value (R-squared⟶GAN=0.776) and moderate predictive value (R-squared⟶BGI=0.606; R-squared⟶GO=0.595; R-squared⟶EI=0.529; R-squared⟶IC=0.352) and weak R-squared⟶EVM=0.268). Therefore, the evidence shows that this model is applicable for green start-ups when developing Green Attitudes towards Nature due to its strong predictive power and explanatory capacity.

Table 5 also shows the hypothesis testing using 5000 bootstrapped resamples. After analysing the path coefficients, there are grounds to assert that all hypothesised relationships are significant at 99.9% confidence levels, except two of them; the first one is ECC⟶GAN, β=0.417, Statistical T=5.116, and the second one is EVM⟶GAN, β=0.539, Statistical T=4.760. These are supported with a 99% confidence level.

As part of the assessment of the structured model, SRMS also needs to be measured to analyse the good fit of the model. In the research, SRMR is 0.075, which is less than 0.08, as Hu and Bentler [72] had expressly indicated.

Blindfolding is also assessed within the model. It measures the predictive capacity of the model through the Stone-Geisser test (Q^2) [73, 74]. The result revealed that the model is predictive (Q^2 = 0.474) since $Q^2 > 0$.

4.3. Results for Unobserved Heterogeneity. The unobserved heterogeneity can to be analysed with different PLS segmentation methods [75, 76]. We select FIMIX-PLS and PLS prediction-oriented segmentation (PLS-POS) methodology for two reasons [76]. First, according to the evaluation of these methods, Sarstedt [75] concludes that FIMIX-PLS is

Table 6: Indices FIT. Criteria for model choice.

	K=2	K=3	K=4	K=5
AIC (criterio de información de Akaike)	1.948,641	1.907,489	1.884,002	**1.864,526**
AIC3 (modificado de AIC con Factor 3)	1.975,641	1.948,489	1.939,002	**1.933,526**
AIC4 (modificado de AIC con Factor 4)	2.002,641	**1.989,489**	1.994,002	2.002,526
BIC (criterio de información Bayesiano)	**2.030,285**	2.031,468	2.050,315	2.073,173
CAIC (AIC consistente)	**2.057,285**	2.072,468	2.105,315	2.142,173
MDL5 (longitud de descripción mínima con Factor 5)	**2.572,865**	2.855,384	3.155,569	3.459,765
LnL (LogLikelihood)	-947,320	-912,744	-887,001	-863,263
EN (estadístico de entropía (normalizado))	0,672	**0,724**	0,722	**0,767**

viewed as the proper commonly used approach to capture heterogeneity in PLS Path Modelling. Second, PLS-POS informs about nonobserved heterogeneity in the structural model as well as the constructs measures, with both formative and reflective models [76].

In order to achieve a major capacity of prediction PLS-POS provides ongoing improvements of the objective targeted. Due to the hill-climbing approach, iterations of the algorithm might generate an intermediate solution, not good enough to be validated. For this reason, it is important to run the application of PLS-POS with different starting segmentations [76]. In our case, we have applied the PLS-POS algorithm with 5, 4, 3, and 2 partitions.

Regarding Becker et al. [76], the bias from using either of the two methods (FIMIX-PLS or PLS-POS) is much lower than that obtained from analysing the overall sample without uncovering heterogeneity [76].

In addition, FIMIX-PLS is understood as better methods for reducing biases in parameters estimates and avoiding inferential. Becker et al. [76] find an exception in low structural model heterogeneity and high formative measurement model heterogeneity. Regarding this condition, FIMIX-PLS generate more biased results than those resulting from ignoring heterogeneity [76].

In our case, we do not find unobserved heterogeneity with PLS-POS algorithm because the results indicate one group too small for the study in all iterations.

As a result, we have used de FIMIX-PLS. This methodology, considers the possibility of acceptance in any segment observed. The observations are adapted depending on the number of segments. Through the linear regression functions a group of potential segments is given. Every case is attached to the segment with the highest probability. FIMIX methodology was applied to structure the sample into several segments. Selecting the convenient number of segments was the first problem found. It is usual to repeat the FIMIX-PLS method with successive numbers of latent classes [77]. In this case, taking into account the sample size n = 152, the calculation was made for k=2, k=3, k=4, and k=5. Different information criteria offered by the FIT indices were used to compare the results obtained. The controlled AIC (CAIC), Akaike (AIC), the standardized entropy statistic (EN), and the Bayesian information criterion (BIC) were compared.

The study is implemented in four stages: in the first place, FIMIX provides the number of best segments. Hence, the construct that confirms these segments is found. As a result, the segments and the model are estimated. Table 6 shows the results provided for the FIT indices.

Firstly, in order to find the number of samplings, it can be organised into the FIMIX test applied. The algorithm for the size of the sample so as to be able to use PLS-SEM with 10 repetitions was constructed. As a result, the new composition was carried out using the expected maximization algorithm (EM). The EM algorithm switches between maximization step (M) and performing an expectation step (E) [78]. Step E assesses the accepted estimation of the variables. Step M measures the parameters by making as big as possible the logarithmic registration likelihood obtained in step E. Steps E and M are used continuously until the results are balanced. The equilibrium is attained when no essential progress in the values is attained.

The results after running FIMIX with different numbers of partitions are shown in Table 6. As the number of segments was unknown beforehand, the different segment numbers were contrasted in terms of appropriateness and statistical analysis [79, 80].

Trial and error information can be conveyed within the EN and information criteria due to their sensitiveness to the features of the model and their data. The data-based approach gave a rough guide of the number of segments [78].

As a result, the criteria applied were assessed. The ability to accomplish aim of the information criteria in FIMIX-PLS was studied for a broad range of data groups [81]. Their outputs indicated that researchers should take into account AIC 3 and CAIC. While these two criteria express the equivalent number of segments, the results possibly show the convenient number of segments. Table 6 shows that in our study these outputs do not indicate the same number of segments, so AIC was utilized with factor 4 (AIC 4, [82]). This index usually behaves appropriately. The same number of segments was shown in the case study (see Table 6), which was k=3. Then, it is understood to be a strong miscalculation, even though MDL5 expressed the minimum number of segments k+1. In this case it would imply 3 [78]. The regulated entropy statistic (EN) was one of the measurements of entropy which was also esteemed [83]. EN applied the likelihood that an observation is addressed to a segment to express if the separation is trustworthy or not. The greater the chance of being included to a segment is for an assessment, the higher segment relationship is. The EN index varies between 0 and 1. The greatest values express the better quality segmentation. Other researches in which EN

Table 7: Relative segment sizes.

K	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5
2	0,537	0,463			
3	**0,384**	**0,310**	**0,307**		
4	0,342	0,325	0,258	0,074	
5	0,462	0,222	0,138	0,131	0,047

Table 8: Path coefficients for the general model and for the three segments.

Path Coefficients	Global model	k=1 (38.4%) n=54	k=2 (31%) n=51	k=3 (30.7%) n=47	MGA k1 vs k2	MGA k1 vs k3	MGA k2 vs k3
ECC⟶EVM	0.620∗ ∗ ∗	0.274∗	0.742∗ ∗ ∗	0.932∗ ∗ ∗	0.468 n.s.	0.659 n.s.	0.190 n.s.
ECC⟶GAN	0.340∗ ∗ ∗	0.363∗∗	-0.033 n.s.	0.015 n.s.	0.397∗∗	0.348∗	0.049 n.s.
EVM⟶EI	0.606∗ ∗ ∗	0.456∗ ∗ ∗	0.548∗ ∗ ∗	0.794∗ ∗ ∗	0.091 n.s.	0.338 n.s.	0.246 n.s.
EVM⟶GAN	0.549∗ ∗ ∗	0.311∗	0.986∗ ∗ ∗	0.978∗ ∗ ∗	0.675 n.s.	0.667 n.s.	0.008 n.s.
EVM⟶GBI	0.692∗ ∗ ∗	0.567∗ ∗ ∗	0.956∗ ∗ ∗	0.541∗ ∗ ∗	0.389 n.s.	0.026 n.s.	0.415∗ ∗ ∗
EVM⟶GO	0.649∗ ∗ ∗	0.550∗ ∗ ∗	0.728∗ ∗ ∗	0.570∗ ∗ ∗	0.178 n.s.	0.021 n.s.	0.157∗
EVM⟶IC	0.537∗ ∗ ∗	0.095 n.s.	0.943∗ ∗ ∗	0.550∗ ∗ ∗	0.848 n.s.	0.455 n.s.	0.393∗ ∗ ∗

Note: n.s., not supported; ∗ $p<0.05$; ∗∗ $p<0.01$; ∗ ∗ ∗ $p<0.001$.

values are above 0.50 which offer easy understanding of the data into the chosen number of segments are also appointed [84, 85]. Table 6 shows that all the segmentations conveyed EN values>0.50, even though the greatest value is achieved for k = 5 with EN=0.767 for k=5 and EN=0.724 for k=3.

Accordingly, the number of best segments was k=3. FIMIX-PLS indicates, then, the number of segments, due to the lowest size of the segmentation, which in this case is 30.7%. Table 7 shows that, for the k=3 solution and a sample n=152, segment partitioning is 38.4% (54), 31% (51), and 30.7% (47) [72, 86]. In spite of the percentages, the segment sizes are significant, so they are enough to use PLS. Due to the covariance, the sample size can be substantially lowest in PLS than in SEM [77]. It means that it might be more variables than observations, which imply data missing can be obtained [87, 88]. Similarly, in similar cases other authors have indicated the reduced size of the sample [89] whose minimum might attain the number of 20 in PLS [90].

The process of the FIMIX-PLS strategy is completed with these analyses. On the other hand, other researches suggest testing to see if the numerical variation between the path coefficients of the segment is also significantly distinctive by using multigroup analysis (see Table 8). Several approaches for multigroup analysis were found in document research, which are discussed in more detail by Sarstedt et al. [81] and Hair et al. [66]. The use of the permutation approach was suggested by Hair et al. [78], which was also used in the SmartPLS 3 software.

However, before making the interpretation of the multigroup analysis outcomes researchers must ensure that the measurement models are invariable in the groups. Once the measurement invariance (MICOM) was checked [79], a multigroup analysis (MGA) was carried out to find if there were any significant discrepancies between the segments. The results are shown in the three right hand side columns of Table 9.

As proven by the results obtained from nonparametric testing, the multigroup PLS-MGA analysis confirmed the parametric tests and also found significant discrepancy between segments 2 and 3.

There is divergence between the first and second segments, but only k=2 and K=3 in EVMGBI, EVMGO, and EVMIC show a significant difference.

Table 9 shows the validity of the segment measurement model and its explanatory capacity using R-squared and classified by segment. The values of k=2 for CR and AVE are shown to be below the limits.

4.3.1. Assessment of the Predictive Validity. PLS can be used for both explanatory and predictive research. In other words, the model has the ability to predict the current and future observations. Predictive validity shows that the measurements for several constructs can predict a dependent latent variable, as, in our case, Green Attitudes towards Nature (GAN). The prediction outside the sample, known as predictive validity, was assessed using cross-validation with maintained samples. This research used the approach recommended by Shmueli et al. [91].

By using other authors' research [92–94], the PLS predict algorithm in the updated SmartPLS software version 3.2.7 was used. The results for k-fold cross prediction errors and the essence of prediction errors. It was expresses through the mean absolute error (MAE) and root mean square error (RMSE). Then, the expected achievement of the PLS model for latent variables and indicators is assessed. The following criterion expressed by the SmartPLS team was applied to appraise the expected achievement of the model [91–94].

(1)The Q^2 value in PLS predict: the miscalculations of the PLS model with the mean future projection are compared.

The PLS-SEM's miscalculation data can be lower than the prediction error of simply using mean values; then the Q^2 value is positive. Therefore, the PLS-SEM model provided

Table 9: Reliability measurements for the general model and for the three segments.

	Global model			k=1 (38.4%)			k=2 (31%)			K=3 (30.7%)		
	CR	AVE	R-squared	CR	AVE	R-squared	CR	AVE	R-squared	CR	AVE	R-squared
ECC	0.922	0.797	-	0.947	0.857	-	0.791	0.561	-	0.912	0.775	-
EI	0.913	0.840	0.368	0.935	0.877	0.208	0.857	0.750	0.300	0.886	0.795	0.631
EVM	0.920	0.794	0.384	0.861	0.675	0.075	0.918	0.789	0.551	0.959	0.885	0.869
GAN	0.917	0.847	0.648	0.908	0.831	0.290	0.861	0.756	0.924	0.940	0.886	0.985
GBI	0.916	0.845	0.479	0.851	0.741	0.322	0.893	0.807	0.914	0.945	0.895	0.293
GO	0.909	0.768	0.421	0.878	0.707	0.302	0.861	0.676	0.529	0.929	0.814	0.325
IC	0.917	0.786	0.288	0.904	0.759	0.009	0.872	0.694	0.899	0.938	0.835	0.303

Table 10: Summary of dependent variable prediction.

Construct GAN	RMSE	MAE	Q^2
Complete sample	0.591	0.425	0.429
Segment 1	0.486	0.376	0.120
Segment 2	0.619	0.468	0.515
Segment 3	0.723	0.490	0.761

convenient predictive performance, which is the case in the two subsamples of segments 2 and 3 (see Table 10) in the dependent construct Green Attitude towards Nature (GAN) (Table 10). Then, the prediction results were achieved.

(2) The linear regression model (LM) approach: a regression of the exogenous indicators in every endogenous indicator was performed. Then, better prediction errors can be achieved when this comparison is considered. This can be seen when the MAE and RMSE values are smaller than those of the LM model. If this occurs, predictions can be made. This methodology is only used for indicators. As shown in Table 10, the MAE and RMSE values were mainly negative. It expressed excellent predictive power.

It is also contrasted the predictions the real composite scores within the sample and outside the sample with [91]. With this intention, the research by Danks, Ray, and Shmueli [95] was applied.

By using this methodology, the measure was applied for the Green Attitudes towards Nature (GAN) construct: RMSE for the complete sample (see Table 10) was 0.591 and had a higher value in segment 3 (0.723, difference=0.132) and lower values in segment 1 (0.486, difference=0.105) and segment 2 (0.619, difference=0.028). The complex values are normalized in which the value of mean is 0 and variance 1. RMSE expressed the standard deviation measure. Since the difference in RMSE is not considerable, excess capacity is not a problem for this study.

In relation to Q^2, the following metrics were found for the GAN construct: RMSE for the complete sample (see Table 10) was 0.429 and had a higher value in segment 3 (0.761, difference=0.332) and lower values in segment 1 (0.120, difference=0.309) and segment 2 (0.515, difference=0.086).

The density diagrams of the residues within the sample and outside the sample are provided in Figure 4.

Due to the result of the different analyses, this research found enough evidence to accept the predictive validity of the

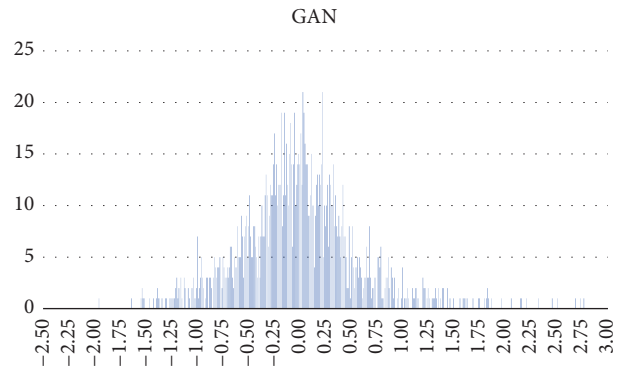

Figure 4: Residue density within the sample and outside the sample.

model expressed. As a result, the model conveys appropriately the intention to apply in further samples. They are quite distinctive from the data used to check the theoretical model [96].

4.4. Considerations for the Management of Internet Search Engines (IPMA). According to research that studied data heterogeneity [77, 96], the IPMA-PLS technique was used to find more precise recommendations for marketing of Internet search engines. IPMA is a framework study that uses matrices that enable combining the average value score for "performance" with the estimation "importance" in PLS-SEM's total effects [77, 97, 98]. The outcomes are shown in an importance-performance chart of four fields [77, 99].

According to Groß [97] the analysis of the four quadrants is shown in the chart (Figure 5). They are expressed consequently in the following points:

(i) Quadrant I conveys acceptance attributes that are much more valued for performance and importance.

(ii) Quadrant II explains acceptance attributes of high importance but small performance. It must be developed.

(iii) Quadrant III considers acceptance attributes that have reduced importance and performance.

(iv) Quadrant IV expresses acceptance attributes with great performance index, but small equitable importance.

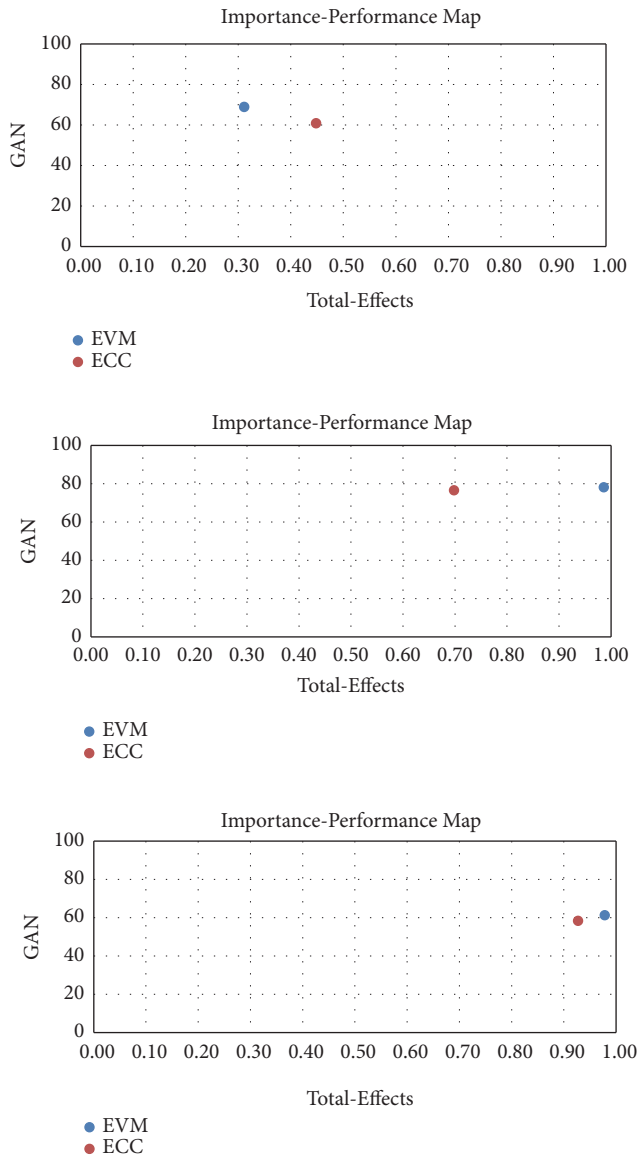

FIGURE 5: Importance-performance maps for k=1, k=2, and k=3.

The results are unequal for each segment (Figure 5). For users belonging to k=1, all constructs are low and provide performance <50, showing that ECC and EVM obtained a score of 0.45 and 0.31.

Finally, the results for k=3 show a different situation. These entrepreneurs valued importance >90, showing that ECC and EVM is the most valued and obtained a score of 0.93 and 0.98.

5. Discussion

5.1. Theoretical Implications. Spanish green start-ups have increasingly developed better green attitudes in recent decades. The new environmental regulatory system has been the driving force behind several changes in the way green start-ups must comply with the law. On the one hand, the Spanish regulatory compliance has established a new legal framework for companies. On the other hand, it proposed the implementation of an organisational model to prevent companies committing unexpected unlawful behaviour.

The FIMIX-PLS analysis has been split into two groups. Coincidentally, the size of the segments and the coefficient of determination R-squared as the FIT indices are divided into two samples groups as well.

Nonparametric unobserved segmentation in complex systems has provided us enough information to compare the statistical results. To present the complete analyses within FIMIX-PLS method multigroup and permutation approach have been taken into account. Results show that segments have presented differences using the multigroup analysis (MGA), namely, between the first and second segments: EVM⟶GBI, EVM⟶GO, and EVM⟶IC.

To revise the validity of the segments measured SmartPLS software version 3.2.7 was used. This statistical package was used to set up the predictive performance of the model. The prediction errors of the PLS model were compared with the simple mean predictions. In the two subsamples of segments 2 and 3 in the dependent construct GAN the prediction error of the PLS-SEM results was less than the prediction error of simply using the mean values. It means that the model provides acceptable prediction results. Similarly, the linear regression model (LM) approach was studied in order to get better prediction errors. It is achieved when the value of RMSE and MAE are lower than those of the LM model. As the results have shown, the indicators show the valued of RMSE and MAE were mostly negative. It can be deduced that those values provide a strong predictive power.

Such findings are manifested through the significance of the path coefficients, particularly, among the influence of Environmental Corporate Compliance in the Environmental Value Model (H_2: ECC⟶EVM; β = 0.697, T-statistic = 2.905) and in the Green Attitudes towards Nature (H_1: ECC⟶GAN; β = 0.417, T-statistic = 5.116). As a result, regulatory compliance not only prevents companies from committing unlawful environmental actions [39] but also from running the risk of any negative implications for nature [4].

The T-statistic in both path coefficients shows little difference. Nevertheless, it is safe to say that the new regulation has a higher effect on improving attitudes towards nature than the Environmental Value Model.

At the empirical level, the new regulation has a significant effect on Spanish green start-ups as a way of improving attitudes towards nature and its Environmental Value Model. In other words, the new Criminal Code raises awareness on monitoring a voluntary environmental surveillance process based on the rules of the organisation [36]. Simultaneously, start-ups are willing to update the environmental standards that allow them to comply with the law by developing a preventive system to deter unlawful decisions taken by its managers [34].

Start-ups should, therefore, implement effective monitoring systems, including organisational monitoring, to avoid unexpected criminal sanctions [38] and keep the compliance model up to date when relevant infractions are revealed [40].

The findings also show that the hypothesised relationships between Environmental Value Model and the four attributes (Balanced Green Investment, Environmental Impact of green entrepreneurs, Innovation and Competitiveness and Green Opportunities) are indeed significant. Based on the results obtained, each attribute creates a real environmental value for start-ups. The environmental value makes them more innovative and competitive (H_5: EVM⟶IC; $\beta = 0.597$, ≤ 0.001) and green-oriented towards market opportunities (H_7: EVM ⟶ GO; $\beta = 0.773$, p value ≤ 0.001) by balancing economy and ecology (H_4: EVM ⟶ BGI; $\beta = 0.780$, p value ≤ 0.001). All these factors contribute towards generating a positive impact in nature (H_6: EVM ⟶ EI; $\beta = 0.730$, p value ≤ 0.001).

5.2. Practical Implications. Practical implications can be drawn from the findings not only for green start-ups but also for public and legal authorities. The first implication is related to the need for empirical studies to test the recent approval of the Spanish regulatory compliance as well as nurture their legal and public decisions. The second implication is directly related to the findings. Results have offered an unexpected picture of what is commonly understood about coercive regulations. Results show that the new regulatory compliance system has emerged as the critical factor to foster green start-ups' respect for nature. The new regulation positively influences start-ups' improvement towards nature (H1: ECC⟶GAN; =0.417, T-statistic=5.116) and has a positive effect on the Environmental Value Model (H2: ECC⟶EVM; = 0.697, T-statistic=2.905). The new environmental law, therefore, plays a key role to explain how these entrepreneurs respect nature, whether by setting up a department to supervise the compliance of green innovations [34] or by undertaking training protocols to implement surveillance norms in the companies [36]. The research also contributes, as the third implication, towards protecting companies from unlawful actions and corruption by developing organisational indicators. In other words, corruption, which is supposed to be negatively associated with private investment and growth, has become an outstanding setback and international phenomenon [98]. This explains the current trend to avert bribery, extortion, or fraud by developing international efforts to address this dilemma from the legal and organisational perspective.

The fourth implication alludes to the model designed. As the results have shown, H4, H5, H6, and H7 are significant. In other words, the four attributes appropriately reflect the Environmental Value Model. On top of that, a balanced economy and ecology are considered the main attributes (H4: EVM⟶BGI =0.780, p value 0.001). Finally, green start-ups are willing to concentrate efforts on environmental and managerial solutions by discovering new Green Opportunities to defend nature. This trend, devised in green entrepreneurs, might positively influence the future of start-ups, as confirmed by the predictive value of the model ($Q^2 = 0.474$).

6. Conclusion

Two relevant contributions have been made to the literature review. The first one has been the methodology it has been applied. This is so not only because it has been used non-parametric unobserved segmentation in complex systems, but also because it gives you another approach about data can be organised to provide statistical results.

The second contribution is that the outcome of this study provides relevant theoretical and practical implications to be incorporated into the literature review. Findings shed light on not only the way green start-ups comply with the recent Spanish Criminal Code, but also how they develop green attitudes towards nature to avoid threats to nature.

This research highlights three aspects regarding the effects of the new regulatory compliance system in Spain: (1) the implications of the new regulation on green start-ups by imposing coercive rules and designing voluntary surveillance measures; (2) the significance of the Environmental Value Model reflected in four green attributes; and (3) the influence of the Environmental Value Model and the new regulation in green start-ups' attitudes towards nature.

The findings provided a robust explanatory capacity of the complete model (R-squared GAN=0.779). In other words, all the constructs explain 77.9% of the variance of start-ups' Green Attitudes towards Nature.

Theoretical and practical implications can also be learnt from this robust result. Even though the literature about green companies is vast, very little has been published about the empirical impact of environmental regulation on green start-ups.

This study helps to shed light on this aspect. Due to the gradual increase in the number of start-ups in the last decades, these findings can be used by public authorities to impose legal requirements and encourage companies to develop surveillance measures through their compliance officers.

To be more precise, we recommend the authorities focus on promoting organisational measures, by rewarding companies that establish protocols or training procedures, and set up surveillance standards within the company. This measure can also be undertaken by developing interconnected mechanisms between public authorities and start-ups based on cooperative rules as a priority to improve the employees' attitudes towards nature. Three limitations of the study must also be appropriately conveyed.

First. A new list of Spanish green start-ups has been proposed in the study by selecting four attributes from the literature review.

Second. Not all start-ups were aware of the recent publication of the Spanish Corporate Compliance Criminal Code let alone implemented it.

Third. The research was based on collecting data on how green start-ups perceived the new regulation and their influence on the model presented. Unfortunately, the research did not offer further information about the design process of organisational standards to prevent unlawful decisions. In other words, a practical and theoretical approach to that phenomenon might yield different results.

Concerning future research lines, it would be advisable to work on these limitations to achieve a more accurate

approach to the current research. Moreover, the research outcomes obtained can be compared with nonenvironmental start-ups, to see how they see nature, as a critical element to be respected by every company to preserve the environment for our future generations.

The research concludes by stating that the three relationships were successfully tested and contrasted by the model. The new Spanish regulatory compliance has provided unexpected results that could contribute to improve the legal decisions taken by public authorities.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

There are no conflicts of interest.

Authors' Contributions

Rafael Robina-Ramírez wrote the theoretical and empirical part. Antonio Fernández-Portillo addressed the FIMIX results. Juan Carlos Díaz-Casero has revised the paper.

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