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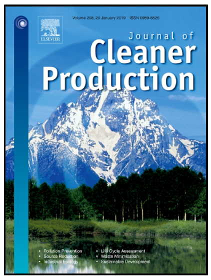


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Juan Ignacio Pulido-Fernández, Pablo Juan Cárdenas-García, Juan Antonio Espinosa-Pulido

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# Does environmental sustainability contribute to tourism growth? An analysis at the country level

Juan Ignacio Pulido-Fernández (Corresponding Author)

*Laboratory of Analysis and Innovation in Tourism (LAInnTUR)*
*Department of Economics - University of Jaén*
*Campus Las Lagunillas, s/n Building D3-273, 23071 Jaén (Spain)*
*E-mail: jipulido@ujaen.es Phone: +34 953 212070*

Pablo Juan Cárdenas-García

*Laboratory of Analysis and Innovation in Tourism (LAInnTUR)*
*Department of Economics - University of Jaén*
*Campus Las Lagunillas, s/n Building D3-231, 23071 Jaén (Spain)*
*E-mail: pcgarcia@ujaen.es Phone: +34 953 212958*

Juan Antonio Espinosa-Pulido

*Laboratory of Analysis and Innovation in Tourism (LAInnTUR)*
*Department of Mathematics - I.E.S. Santa Catalina de Alejandría*
*Av. Ruiz Jiménez, 16, 23008 Jaén, España (Spain)*
*E-mail: jaespu@gmail.com Phone: +34 953 366617*

## 1. Introduction

More than thirty years have passed since the Brundtland Report was published in 1987 and as shown by Ruhanen et al. (2015: 517) "the debate, discourse, and criticism of this subfield of tourism research continues". The debate is far from over, and the questions raised in the investigative environment are far from having been resolved, especially due to their real world implications. Studies, such as those by Buckley (2012), Ruhanen et al. (2015) or Weiler et al. (2012), to cite a few of the more recent ones which show that there is a growing interest for sustainable tourism, recognized that current advances are still limited especially with regards to the practical application of theoretical and methodological progress obtained in recent years.

One of the most controversial topics of recent years in this regard is related to the contribution of sustainability to touristic competitiveness. For example, Ritchie & Crouch (2000: 5) recognized that competitiveness is "illusory without sustainability". In fact, as shown by Pulido-Fernández et al. (2015: 48), "all models that have been designed to identify and study the determinants of a destination's competitiveness consider sustainability to be a key factor".

Additionally, in reports published by international organizations and institutions a special emphasis is made on the positive influence that sustainability can have on the process of touristic development and, at the same time, those processes related to the economic growth of the destinations. In this way, these organizations have tried to justify the need for destinations to invest in improving sustainability. In this sense, the report published by UNEP (2011) showed that a growing trend in the tourism industry is to invest in improving the environmental dimension of sustainability. Another report published by UNWTO (2013: 12) tried to show that sustainable tourism "is a vehicle to foster economic and social growth". The Global Sustainable Tourism Council is also working to show that sustainability can promote business prosperity, increase benefits for the host community, and protect and conserve natural and cultural resources.

However, there have been no lack of authors for whom, at least over the short term, advances in sustainability call for an expenditure on behalf of the tourism industry, which is now reporting scarce earnings (Black & Crabtree, 2007; McDonald et al., 2009; Robèrt et al., 2002). According to this type of approach, a touristic firm or business should not invest in sustainability because it does not lead to an immediate economic benefit, which is why it has proved difficult, if not impossible, for these destinations to advance in terms of sustainability.

Bramwell & Lane (1993: 2) have championed for two decades that "sustainable tourism is a positive approach intended to reduce the tensions and friction created by the complex interactions between the tourism industry, visitors, the environment and the communities which are host to holidaymakers. It is an approach which involves working for the long-term viability and quality of both natural and human resources. It is not anti-growth but it acknowledges that there are limits to growth".

In this context, the underlying hypothesis of the investigation that is presented in this paper is that sustainability (considered in this paper as environmental sustainability, due to information not being available to measure the remaining dimensions that make up sustainability) has a significant and positive influence on the economic growth of touristic activity (referred to as tourism growth). In conclusion, if this hypothesis were verified, it would confirm that investment in a destination for improved sustainability of its touristic activity will contribute to its tourism growth.

The objective, in short, of this paper was to analyse, by means of an analysis of structural equations applied on a country level that used a sample of 139 countries during the last ten years, if an improvement in the environmental sustainability of those countries under consideration has contributed to a growth of their primary touristic levels.

## 2. Literature review

As Lu & Nepal (2009) recognised, the concept of sustainable tourism has different meanings for different interest groups and these meanings are subject to individual characteristics such as culture, education or background, as well as, possibly, organisational affiliation or political agenda. Many definitions have been given for sustainable tourism, although it seems that there already exists an obvious consensus surrounding the concept coined by UNWTO-UNEP (2005: 12); "tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, and the environment and host communities".

The debate on the sustainability of tourism has grown in importance over recent decades. This is due, among other reasons, to the fact that public administrations have become increasingly conscious of the limits of the use of natural and cultural resources, as well as the negative impact that tourism, without appropriate measures, can have on the environment, on society, and indeed on people (Amado et al., 2017).

On the other hand, sustainability has traditionally been considered as the key element in the primary models in the literature on tourism competitiveness (Pulido-Fernández et al., 2015). Some authors (Hu & Wall, 2005; Huybers & Bennett, 2003) have specifically referred to environmental sustainability as a key variable for the competitiveness of touristic destinations over the long term, or for improvement in the quality of life of the local population (Farsari et al., 2007). Cucculelli & Goffi (2016) showed that sustainability variables have a greater impact than other variables on the competitiveness of tourism.

Additionally, in recent years, there has been an emphasis on an emerging green tourism market (Bergin-Seers & Mair, 2009), and as was shown by Sirakaya-Turk et al. (2013: 115), "the notion of sustainability has gained widespread acceptance in the hospitality industry as part of a strategy to encourage a *green consumer*". Along the same lines, Lundie et al. (2007) emphasized that tourists who produce positive economic outcomes for a destination are associated with adverse environmental effects (ecological footprint, water, energy use and GHG emissions). Facing this new opportunity, Dwyer & Thomas (2012) suggested the need for identifying the most profitable market sectors, thus generating new products that assure greater economic benefits.

Nevertheless, other authors, such as Kang et al. (2012), Sharp (2013) or Weaver (2012), maintained that this supposed interest by the consumer towards environmental issues is more fictitious than real. Even Sirakaya-Turk et al. (2013: 115) recognised that "actual findings relating to that theoretical consumer are scarce". Similarly, Mihalic (2016) showed that, despite the treatment of this issue in the academic world, the practical implementation of sustainability in tourism remains problematic.

In the framework for action – which is currently more promotional than real – developed by UNEP and other organisations for a transition towards a green economy, the focus of attention has been put on demonstrating that "greening" the economy is not always a hindrance for growth, but can be a new driving force, which creates a source of worthwhile work that also provides an essential strategy to eradicate persistent poverty. The report from UNEP (2011) also tried to motivate those people responsible for establishing policies, in order to create favourable conditions that would produce greater investment in the transition towards a green economy.

The report published by UNEP-UNWTO (2012: 41) suggested that investing in sustainable tourism "offers a wide range of opportunities that can generate significant returns". This report collected countless examples of initiatives for the sustainable management of water, energy, waste, or biodiversity, which have contributed to a reduction in costs for the tourism industry.

A large number of scientific studies have shown the interdisciplinary relationship between sustainability and tourism, highlighting the need for a continuous redefinition of the challenges of sustainability so that the development of tourism can generate benefits for the environment and for society itself (Kristjánsdóttir et al., 2018).

Along the same lines, Pulido-Fernández et al. (2015) showed that progress in sustainable tourism did not affect the main economic levels of tourism over the short term. These authors analysed the evolution of touristic levels in 128 countries between 2008 and 2011, concluding that the effort made by some of these countries to improve their sustainable tourism did not negatively affect them in terms of their economic performance.

In general, the feeling that is taken away from review literature is that, even today, there is a lack of pressure on the tourism industry to decidedly develop sustainability, considering it to be a significant expense that generates scarce benefits for them (Black & Crabtree, 2007) and that, furthermore, as was shown by Welford et al. (1999), there are important "gaps in finding ways of applying the sustainability principles in practice". In fact, as Robèrt et al. (2002: 201–202) recognized: "from a sustainability perspective the public debate often focuses on the short-term consequences […] and hence short-term economic arguments are often used to justify an unwillingness to change established routines".

It is true that an investment in sustainable tourism could generate costs over the short term, but there is also evidence that the widening of these types of measures has contributed to the improvement of primary economic levels for tourism in some of the destinations where they have been implemented and so these measures have, therefore, created an improvement in those destinations' global competitiveness.

Hence, it is necessary to insist on the need to improve the practices of touristic production and consumption, thus ensuring their higher sustainability. However, again, there also appears to be a lack of agreement with respect to those who are responsible for this transformation. While there are authors who defend the need to direct efforts to create higher environmental awareness for tourists and local communities, "in order to create the demand for environment protection and exert more pressure on the different stakeholders to respond to the need to maintain and preserve pristine and sensitive environments in different regions in the world" (Shaalan, 2005: 87), others suggest that the key role in this entire process falls on the tour operators. As was shown by Budeanu (2005: 93), "the tour operator has been recognized as holding a great possibility and responsibility for triggering such essential changes in attitudes and actions of producers and consumers, towards more sustainable tourism practices". In a similar vein, Sigala (2008: 1589) stated that three key aspects could be identified that substantiate the important role that tour operators have in this process of transformation given that they "(a) greatly influence the volume and direction of tourism flows; (b) integrate and affect attitudes and practices of numerous tourism suppliers and stakeholders; and (c) lead to widespread benefits due to their large size".

Tourism marketing in recent years seems to have understood the needs of the market here, in designing more sustainable products and identifying more persuasive methods of communication in order to achieve a change in behaviour in tourists regarding their involvement in sustainability; this has been possible through emphasizing the motivations, mechanisms, and barriers facing companies and, furthermore, by changes in the behaviour of the consumer (Font & McCabe, 2017).

In this context, this investigation tried to contribute to the debate on the relationship between sustainability, competitiveness and growth, which are, as stated by Esparon et al. (2015: 709), "essential parts of the sustainable destination planning equation". The goal, which has already been pointed out, was to try and demonstrate that an improvement in environmental sustainability will not become a detriment to the primary variables of touristic growth and that, therefore, the stakeholders in a destination should move in this direction, making decisions by themselves, and pressuring others who are responsible for making similar decisions.

## 3. Methodological approach

This research aimed to find out whether there is a relationship between the growth of tourism in the countries and their level of environmental sustainability. In order to meet this objective, the outline of this research, the research techniques used, and the sources of information that were consulted are stated below.

### *3.1. Previous considerations*

It seemed reasonable that the design of the empirical study would have the objective of establishing whether environmental sustainability affected tourism growth using an analysis at country level, while discarding other, more partial, approaches which analysed the impact studies for a particular tourist resource or tourism area (Crompton et al., 2001). Thus, a sample as large as possible was selected, formed by 139 countries – all countries for which there was existing data for the time frame analysed with regard to the selected variables.

In addition, an empirical analysis aimed at determining the link between tourism growth and environmental sustainability must consider the fact that these two dimensions are multidimensional; thus, the use of multiple variables for their measurement (Blancas et al., 2018).

### *3.2. Data collection*

The information used in this study to measure environmental sustainability was obtained from the World Economic Forum (WEF) and World Bank (WB). First, the Travel & Tourism Competitiveness Index (TTCI) – elaborated by the World Economic Forum – aims to measure, among other mainstays, one which quantifies different variables of environmental sustainability (World Economic Forum, 2017). Therefore, the role of the TTCI in identifying environmental sustainability was essential. Second, the role of the World Bank in identifying environmental sustainability is also of great importance, given that it compiles data through different sources – countries and international organizations that are members of the World Bank, private associations and NGOs – as World Development Indicators (World Bank, 2017), which made it possible to analyse other factors of environmental sustainability (factors other than the TTCI) at country level. In this case, a total of 13 environmental sustainability variables were employed (Table 1).

**Table 1**

The Tourism Impact Data & Forecast database was used to quantify the growth of tourism. This database, prepared in accordance with the methods of the Tourism Satellite Account by the World Travel & Tourism Council (WTTC) and its research partner, Oxford Economics, was used to measure the economic growth derived from tourism, quantifying the main contributions of tourism to economic growth, with the advantage that these variables allowed comparison, in a homogeneous manner, across countries (World Travel and Tourism Council, 2017). Specifically, a total of five tourism growth variables were employed (Table 2).

**Table 2**

The difficulty in obtaining quantitative information must be borne in mind (since a large sample of countries and a significant time frame was used); there were, of course, variables that could be used to measure the level of environmental sustainability of a country, as well as the tourism growth that it experienced, but which could not be used due to there being a lack of data or because of their not adapting to the time frame under consideration.

Furthermore, in relation to the quantification of environmental sustainability, it is necessary to indicate that not all factors have the same type of relationship (while the number of ratified environmental treaties has a direct relationship with the level of environmental sustainability, $CO_2$ emissions have an inverse relationship); so the type of relationship each variable has with the level of environmental sustainability has been taken into account.

Despite the limitations that these three databases may have, the information obtained from the World Economic Forum, World Bank and World Travel & Tourism Council, was more consistent and reliable, in addition to the fact that any limitations are minor if compared to the information that could be obtained from other sources. Besides, using another data source would have meant that the number of countries with available data would have been significantly lower.

### *3.3. Period analysed*

Any empirical work aimed at determining whether environmental sustainability affects tourism growth should be done within a wide enough time frame.

However, there is a time restriction which must be taken into consideration based on the publication date of the different databases used in the present paper and on the latest available information relating to the analysed variables. With regards to the first year with information for all variables, the restriction was determined by the World Economic Forum database, which was first published in 2007. The last year with information for all the variables is 2016, given that the most recent reports from the World Bank and the World Economic Forum, published in 2017, correspond to that year.

The time frame taken in this research, then, included data from 2007 to 2016, a period of ten years.

### *3.4. Preparation of the variables*

First, standardised values were calculated for the thirteen environmental sustainability variables (SER, EER, SID, PMC, TS, ETR, WHN, QNE, TKS, EPF, $CO_2$, TPA and MPA) and the five tourism growth variables (TCG, TCE, VE, IC and CI), individually for each year, in order to re-scale the different measures into a same unit system as a standard process for the homogenization of the information.

It is important to bear in mind, both in the design of the research and in the subsequent interpretation of the results that, as can be observed in the detail of the variables used to measure environmental sustainability (Table 1), as opposed to what happens with the other variables, the PMC, TS, EPF and $CO_2$ variables have an inverse relationship with environmental sustainability, since higher values translate into lower environmental sustainability, and vice versa.

Although initially, full structural equations were intended to be analysed, using data from 2007 and 2016 individually, including in the statistical methods controlled factors to take into account measures over time, the sample size was not sufficient for this to be applicable; and so the change over time was considered as a representative measure that reduced dimensionality, allowing the structure to be checked, the hypothesis of this study to be proved, and more robust structural equation models to be performed. Thus, the change over time for each of the variables was obtained by subtracting the 2016 values from the 2007 values, and standardising those differences, with the aim of re-scaling all variables into the same units.

### *3.5. Statistical Methods*

In order to verify the reliability of the variables of the dimensions, internal consistency was assessed using Cronbach's alpha coefficient (Cronbach, 1951), for each dimension. Confirmatory factor analyses (CFA) were fitted to confirm the dimensions for environmental sustainability and tourism growth (latent factors). After checking the structure of the individual dimensions, and with the aim of determining the relationship between change of environmental sustainability and tourism growth, a structural equation model (SEM) was developed where tourism growth is regressed on environmental sustainability.

Structural equation modelling (Blunch, 2008; Iacobucci, 2009; Kline, 2011) makes it possible to measure the simultaneous relationships occurring between a set of independent variables and a set of dependent variables, allowing then for the identification of causal relationships between latent variables. In order to select an appropriate method for fitting the model, the univariate normality for each item was checked; for those the skewness and kurtosis measures were obtained. For testing multivariate normality the Henze-Zirkler test (Henze & Zirkler, 1990) was performed – tables of multivariate normality testing are available upon request to the authors. Since the multivariate normality of the data was not met for any of the levels, the structural equation models were fitted by using the diagonalised weighted least squares (DWLS) method (Jöreskog & Sörbom, 1996a: 23–24) and in some cases, robust standard errors and a mean-and-variance-corrected (second order) correction was used (adjusted test statistic) (Chou, Bentler & Satorra, 1991; Curran, West & Finch, 1996; Mass & Hox, 2004; Hox & Mass, 2010).

The goodness of fit for the proposed models was measured by using the Tucker Lewis Index (TLI) and Comparative Fit Index (CFI). For both of them values greater than 0.9 indicate a good fit of the model. Another measure used was the Root Mean Square Error of Approximation (RMSEA) where values less than 0.08 indicate a good model fit. Furthermore, the upper limit of the 90% confidence interval should be below the 0.1 cut-off value for a good model fit. The SRMR is an absolute measure of fit defined as the normalization of the difference between the observed and the predicted correlation. An SRMR value of less than 0.08 is considered as an adequate cut-off point for the goodness of fit (Hu & Bentler, 1990; Hopper et al., 2008).

A model-based cluster analysis was used to classify the countries depending on their environmental sustainability and tourism growth scores (Fraley, 2002). Statistical differences in the environmental sustainability and tourism growth between clusters of countries were checked by multivariate statistical testing using bootstrap methods for estimation – since the normality assumption was not met (Davison & Hinkley, 1997). This analysis was performed with the aim of classifying countries with homogeneous behaviour of a tendency over time in environmental and tourism parameters within a group, and heterogeneous behaviour between groups. Then, with the aim of comparing the dimensions between groups, a profile type of country in each cluster was defined and, in order to validate the structural model proposed in this analysis, the statistical tests for differences in the environmental sustainability and tourism growth variables between groups were used.

The structural equation models were implemented using the software R and the Lavaan package (Rosseel, 2012). The mclust package in R was used to perform the country classification. SPSS software was used to describe the data and to perform multivariate statistical testing using bootstrap methods. Statistical tests were performed at two-side 5% significance level.

## 4. Results

A summary of the data is presented in Table 3. The mean, standard errors, mean of changes overtime and its 95% confidence intervals are shown.

On average, there was a generalized growth of the variables used to measure the touristic activity dimension during the ten years of the time frame under consideration, with the exception of TCE.

Furthermore, there was also an improvement in the environmental sustainability dimension during the period under consideration in a generalized manner in all the variables used for its quantification, with the exception of SID, QNE and TS (it must be taken into account, as mentioned above, that this last variable has an inverse relationship with environmental sustainability, since higher values of these variables are a symptom of lower environmental sustainability, and vice versa).

**Table 3**

In order to check the internal consistency for the environmental sustainability and tourism growth, for each year, the internal consistency of each dimension was measured by Cronbach's alpha, and whose values were as follows: the environmental sustainability in 2007 had a Cronbach's alpha of 0.613 and in 2016 it was 0.655, tourism growth in 2007 had a Cronbach's alpha of 0.933 and in 2016 it was 0.949; showing in both cases a fair consistency of scale, with reproducibility along the period of study.

Figure 1a shows the results from the confirmatory structural model fitted to the environmental sustainability. This model is broken down into two dimensions:

i) a dimension called the "regulatory dimension" that encompasses those variables related to the regulations implemented by the different countries in relation to the improvement of environmental sustainability. The relationship of these variables with environmental sustainability is direct, except for the PMC variable, which means that a higher value of these variables at the individual level translates into an improvement of environmental sustainability, given that it supposes a greater fulfilment of the regulation referring to environmental issues on the part of the country analysed.

ii) another dimension called the "risk dimension" that is related to those variables whose evolution may pose a risk to the environmental sustainability of the country analysed. The relationship of these variables with environmental sustainability is inverse, except for the variables TPA and MPA, which means that a higher value of these variables at the individual level translates into a worsening of environmental sustainability, given that it poses a greater risk to the environmental situation of the country under consideration.

Both dimensions are negatively correlated (weak correlation), complementing the full environmental sustainability dimension. (Goodness of fit for the model CFI= 0.813 and TLI = 0.772, RMSEA = 0.036 (90% C.I. (0.001, 0.079)) and SRMR = 0.1. Chi-square p-value 0.275 (79 observations)).

**Figure 1a**

Non-significant loads were observed for ETR and WHN, TKS and MPA, perhaps due to missing observations for those variables from some of the countries, so a further model removing those variables was fitted and the internal consistency was re-calculated. After excluding those variables, Cronbach's alpha was 0.643 and 0.692, for 2007 and 2016, respectively. The goodness of fit of the confirmatory model after removing those variables improved and sample size increased, mainly because the MPA variable did not have quantification for some countries analysed since they do not have access to the sea. Thus, although the goodness of fit of the full model with all variables was confirmed with the data collected, the reduced model will be considered for this study. The reduced model was selected for two main reasons: first, to consider all possible countries, including those that do not have access to the sea, and second, because there was a small improvement of the goodness of fit of the model after removing those variables that were not significant (see in Figure 1a and 1b results from the full and reduced model. Furthermore, the increase of sample size influences the improvement of the goodness of fit of the confirmatory model).

The standardised results of the model are presented in Figure 1b showing that each dimension combined negative and positive influences to the environment, with negative or positive loads in agreement with the nature of the data and the direct or inverse relationship of these variables with environmental sustainability as previously mentioned. (Goodness of fit for the model CFI= 0.99 and TLI = 0.99, RMSEA = 0.019 (90% C.I. (0.001, 0.058)) and SRMR = 0.046. Chi-square p-value 0.415 (100 observations)).

**Figure 1b**

With regard to the "regulatory dimension", given that these variables are mostly directly related to environmental sustainability, since they are related to the level of implementation of the regulations related to environmental issues in the country under consideration, the impact of this dimension on sustainability is positive, given that the only parameter with a negative value is the PMC variable which, as previously mentioned, has an inverse relationship with environmental sustainability and which, therefore, negatively affects compliance with environmental regulations.

However, with regard to the "risk dimension", given that these variables mostly have an inverse relationship with environmental sustainability as they are related to risk factors in environmental issues for the country under consideration, the positive value of the aforementioned variables supposes as a whole a greater risk for environmental sustainability, with the exception of the TPA variable, which, as previously mentioned, is directly related to environmental sustainability.

Finally, the relation between the two dimensions is in agreement with their construct, where there is a negative association between them. This result substantiates the different relationships that the variables of each dimension have with environmental sustainability, variables with a direct relationship in the case of the "regulatory dimension" and variables with an inverse relationship in the case of the "risk dimension", that is to say, environmental sustainability is shown by a higher score in compliance with regulations and a lower score in risk, the latter dimension being associated in a negative way with the regulatory one (hence the estimator is negative).

Furthermore, the negative association is not strong, indicating that both dimensions are relevant to the environment and are complemented when explaining the variability of environmental sustainability.

The result from the CFA applying the dimension of the change of tourism growth over time is shown in Figure 2. A negative load for the tourism growth was obtained from the Total Contribution to Employment; the reason may be due to an overall reduction of TCE values from 2007 to 2016 from almost all countries (see descriptive table), which is explained by the incorporation of information and communication technologies in many links of the value chain (intermediation or information), reducing the number of jobs in that sector on a general level. Also a relation between IC and CI not measured or explained by tourism growth was detected (a correlation of 0.71, this may suggest that other dimensions different from the latent dimension may influence these two variables, IC and CI). Nevertheless, the goodness of fit of the model indicates the validity of the overall structure of the dimension. (Goodness of fit for the model CFI= 0.972 and TLI = 0.930, RMSEA = 0.014 (90% C.I. (0.001, 0.09)) and SRMR = 0.08. Chi-squared p-value 0.393 (139 observations)).

**Figure 2**

### *4.1. Influence of environmental sustainability on tourism growth*

The standardised solution of the structural equation model that fits the relationship between the change of environmental sustainability and change in tourism growth is shown in Figure 3 and Table 4.

A direct association was found for the "regulatory dimension" of environmental sustainability with tourism growth; it was observed that tourism growth increases when the environmental sustainability increases in relation to policies and regulation, in line with the work of Azam et al. (2018).

However, growth in touristic activity also has a direct relationship with the "risk dimension" of environmental sustainability; that is to say, the expansion of tourism implies a greater risk of the country worsening in factors related to the environmental dimension of sustainability, as shown by Meng et al. (2016).

The results from the model suggested that an improvement in policies and regulation will increase tourism growth, although this also increases contamination of the environment (Pace, 2016). Part of this contamination may be counteracted by an improvement in the regulations of the country; however, the association between them is quite weak (-0.02; and so other factors not considered in the model associated with the risk dimension). (Goodness of fit for the model CFI= 0.99 and TLI = 0.99, RMSEA< 0.01 (90% C.I. (<0.001, 0.05)) and SRMR = 0.08. Chi-squared p-value 0.988 (100 observations)).

**Figure 3**

**Table 4**

### *4.2. Improvement and deterioration of environmental sustainability*

The previous analysis was performed using all of the countries that make up the initial sample and has complete information for the variables used in the model. Overall, it was found that an improvement in the environmental sustainability related to policies or regulations influences the tourism growth of a country, which affects the environmental sustainability related to contamination. However, not all of the countries from the sample improved their environmental sustainability in relation with their tourism growth to the same degree, and so a further analysis that classifies the countries into groups depending on their environmental sustainability and tourism growth was performed. Then, statistical analysis for testing differences in changes of the environmental and tourism variables between groups of countries was carried out. Thus, groups of countries could be fully characterised based on changes over time and a profile of a type of country by group could be defined. Using model-based cluster analysis, the countries were classified based on their score values. The classification of the countries using the cluster model provided a three clusters solution, where countries were distributed as follows in Table 5 and Table 6.

**Table 5**

Once the groups of countries were created, the goal was to contrast the relationships of the environmental sustainability and tourism growth found in our model with the aim of verifying if the previously obtained estimates would hold up, considered together with all of the countries in the sample, and to define groups of countries with different profiles regarding their environmental and tourism variables.

**Table 6**

**Table 7**

Table 7 shows the mean of the differences over time for the environmental sustainability and tourism growth variables. P-values from the statistical tests performed on paired cluster comparison, using Sidak-correction and bootstrap methods, were also presented. It can be seen that the countries in the HTG cluster, having greater compliance with environmental regulations, are those with the greatest growth in tourism, with significant improvements from 2007 in almost all the tourism growth variables compared to the rest of the cluster.

In relation to environmental sustainability, first of all, the countries in the HTG cluster have greater compliance with environmental policies and regulations than the other two clusters of countries. The other two clusters have similar behaviour of environmental regulations.

Secondly, with regard to environmental risk factors, the countries in the HTG and LTG cluster have a similar behaviour, with environmental pollution being significantly worse in the countries of the MTG cluster.

In general, countries in the HTG cluster have a greater compliance with environmental regulations, which translates, as was commented on during the global analysis of countries, into having a greater growth of tourism. On the other hand, the countries in the LTG and MTG cluster have a similar level in terms of compliance with environmental regulations (lower than the other cluster), with environmental pollution being worse in the MTG cluster. Note that there was not enough data per group to perform subgroup structural equation models.

Finally, having fitted the structural equation model of the causal relationship between environmental sustainability and tourism growth, the calculation of the scores for the environment and tourism growth dimensions based on the results from the model were obtained.

A significant difference was found in the tourism growth score between the HTG and LTG groups, with a higher average point value for the HTG cluster ($p = 0.003$); in addition, the growth of tourism in the HTG group was significantly greater than in the MTG group ($p = 0.05$).

On the other hand, a significant difference in the overall score for the two dimensions of environment between the LTG and MTG cluster was found, with higher score values within the LTG cluster in comparison with the MTG cluster ($p = 0.045$ and $p = 0.011$, for each dimension respectively).

## 5. Discussion

In spite of how much the paradigm of sustainable tourism has been studied and discussed in the last twenty-five years, there are still many issues pending (Buckley, 2012) and, above all, convincing measures are still being adopted that will ensure the transformation of the processes for touristic consumption and production towards that of sustainability (UNWTO-UNEP, 2012).

One of the least discussed topics, regarding the contributions of the scientific literature (beyond that of mere case studies, primarily centred on those aspects of the hotel industry, restaurant business and transportation), which are very scarce, is the possible contribution of sustainability to touristic competitiveness and therefore the growth of touristic destinations.

The arguments that justify the scarce interest for sustainability on behalf of the primary players involved in the touristic development of a territory tend to be one of two types. On one side, they argue that a transformation in search of an improvement for sustainability has a high cost that, at least over the short term, is not compensated by means of an increase in income. And on the other side, it is suggested that tourists, despite surveys often showing their willingness to pay more for a sustainable product or destination, in reality, continue to place the price of the destination before any other attribute when making their decision.

Both arguments have started to be rejected in recent years. In fact, the number of studies that show the existence of a segment of pro-sustainability tourists has continued to grow (Hedlund, 2011; Sharpley, 2014; Weeden, 2013; Werhrli et al., 2013) and, consequently, as noted by Darnall et al. (2012), sustainable consumption is often perceived as a business opportunity.

Furthermore, with respect to the goal of this article, studies have begun to be published that reveal that an investment in sustainability does not necessarily go against economic performance. Along the same lines, the published works of Esparon et al. (2015) or Pulido-Fernández et al. (2015) considered an interesting perspective, which our investigation has delved into.

Therefore, it is important that stakeholders have a greater awareness of the important role that sustainability plays for the competitiveness of touristic destinations, for the primary variables of tourism growth and also, if adequate decisions are made, for key aspects in the improvement of the quality of life of the local population (Farsari et al., 2007), so that sustainability should be the end goal of any process of touristic development.

The investigation has therefore turned into an interesting contribution to the discussion for those who argue that the stakeholders of a destination should work on transforming their touristic models to one of sustainability, making decisions on their own and pressuring others who are in a position of responsibility to make similar decisions.

**6. Conclusions**

The results that have been found confirm the hypothesis presented at the beginning of this investigation and, with this in mind, they support the proposals of the authors. In effect, the results have confirmed that an improvement in environmental sustainability is not made at the expense of the variable principles of tourism growth, and, indeed, that precisely the contrary is true.

The results from the model suggest that an improvement in policies and regulation will increase tourism growth, although when tourism increases, so does, in turn, contamination of the environment, so that the relationship between tourism and environmental sustainability is shown to be bidirectional. However, although there is this significant and positive influence of environmental sustainability on tourism growth, the association factor is relatively low, indicating that there are other factors that influence tourism growth (obviously, the development of tourism is also affected by the quality of the accommodation on offer, the number of tourist resources, or the accessibility of the destination, among other factors). Therefore, it would be interesting in the future to develop a more complete model (one with a greater number of variables) that would allow other factors associated with tourism growth to be found.

In addition, the results obtained in the structural equation model, have shown that an increase in tourism has a direct influence on the environmental sustainability of tourist destinations. However, as has been highlighted throughout this paper, while the direct positive relationship between tourism and the regulatory dimension translates into an improvement in environmental sustainability, the direct positive relationship between tourism and the risk dimension implies a lowering of environmental sustainability, due to the fact that the variables that measure this second dimension have an inverse relationship with sustainability. These results are in line with what has been contributed by the majority of international organizations and institutions, as well as with the results obtained by a large part of the scientific literature.

After contrasting the initial hypothesis proposed in this paper, a differentiated analysis was carried out on the three clusters of countries, depending on the level of tourism growth during the ten years of the time frame.

In general, countries from the HTG cluster (high tourism growth) have better policies and regulations and, therefore, a higher growth of tourism, which confirms the conclusion already obtained in the global analysis of countries. On the other hand, countries from the LTG cluster and MTG cluster have similar qualities of regulation and policies (hence, there is no statistically significant difference in tourism growth), with the difference that in the MTG cluster contamination is worse than in the LTG cluster.

This is because, as noted above, not everything that influences tourism growth is covered by environmental factors, as is logical, and not everything that produces more pollution is due only to tourism growth.

In summary, stakeholders of any tourist destination should promote those environmental variables that translate into growth of touristic activity, because of the undoubted benefits that tourism contributes to the host society, as well as limiting the negative impacts that such activity poses for the environment and its potential for future growth.

Finally, it should be noted, as a limitation of this study, that there was not enough data per group to perform subgroup structural equation models. It was not possible to perform analysis by subgroups due to the small amount of data, and, where there is no normality, structural analyses require more data to be reliable and applicable. To overcome the aforementioned limitation, while at the same time suggesting a new line of research, an analysis grouped by tourist destinations could be carried out, instead of an analysis at the country level, which would take into account the particularities of each type of tourism (for example: sun and beach, business, or rural, among others), and which would mean having to resort to local information sources that might not measure the same factors or might not be comparable.

Furthermore, for the quantification of each dimension of environmental sustainability, as well as economic growth, specific variables were used from the databases detailed in this work, so it is clear that there may be other variables that could have also been used for the same purpose but which, however, were not used. There is the possibility of this causing bias when interpreting the results.

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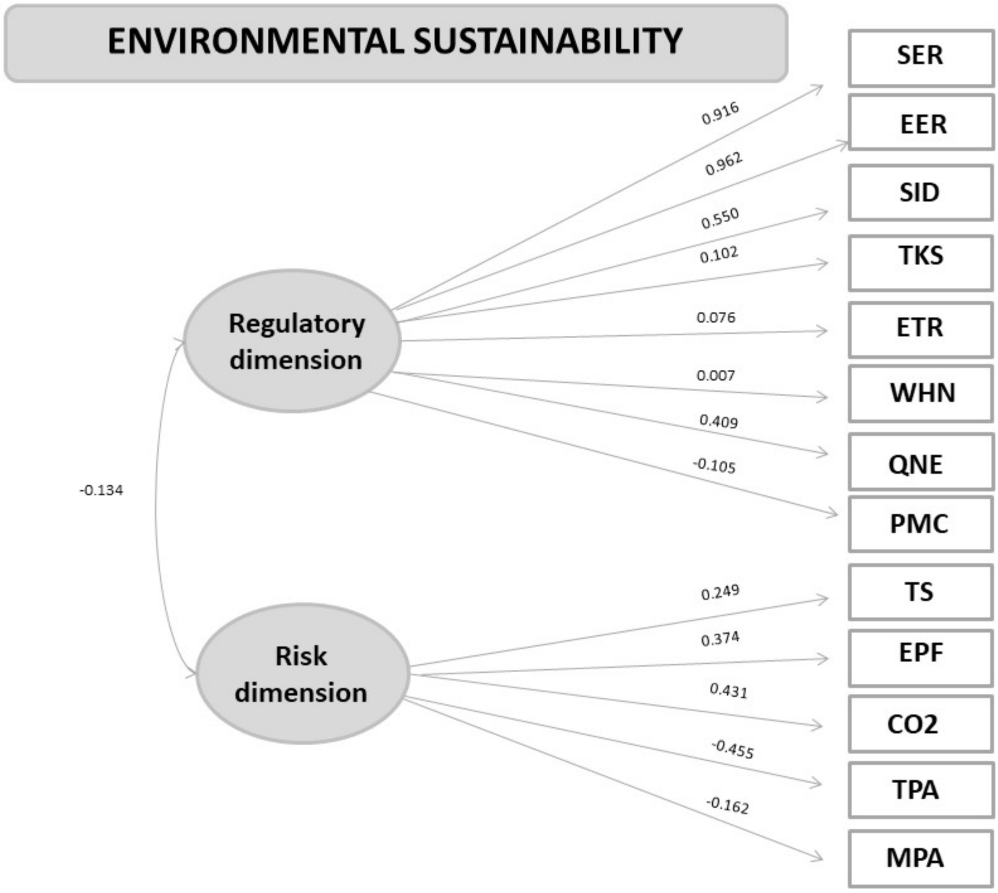


**Figure 1a.** Standardised solution for the confirmatory structural model of environmental sustainability (full set of variables)

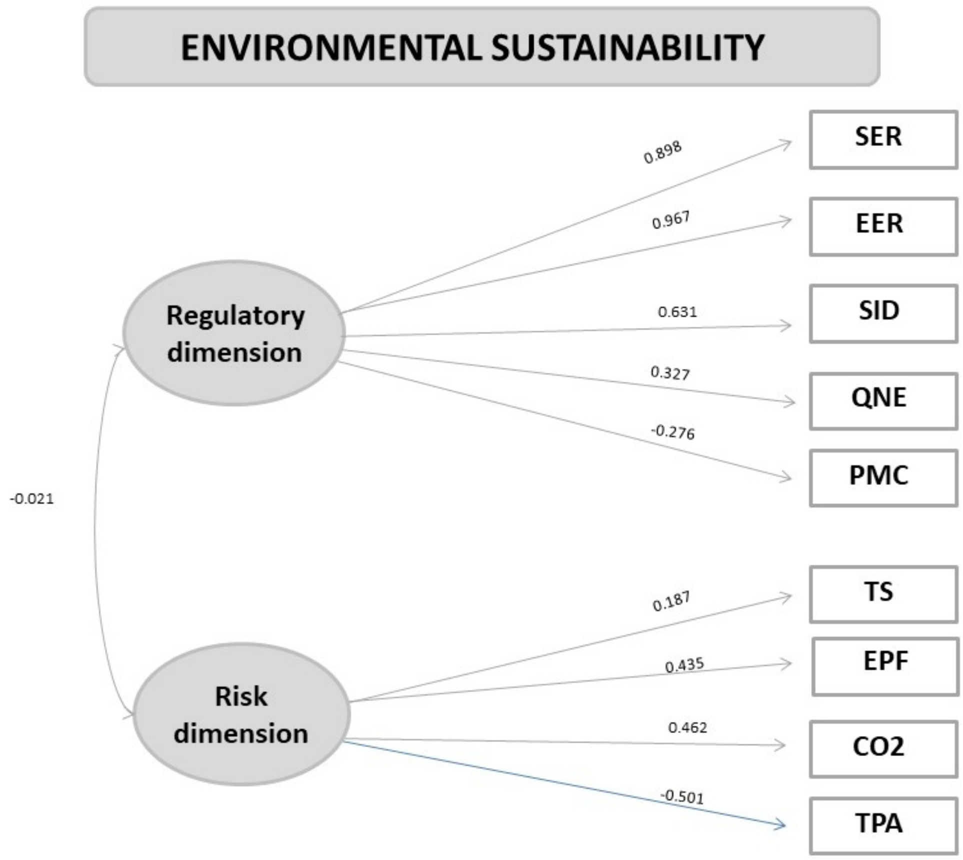


**Figure 1b.** Standardised solution for the confirmatory structural model of environmental sustainability (reduced set of variables)

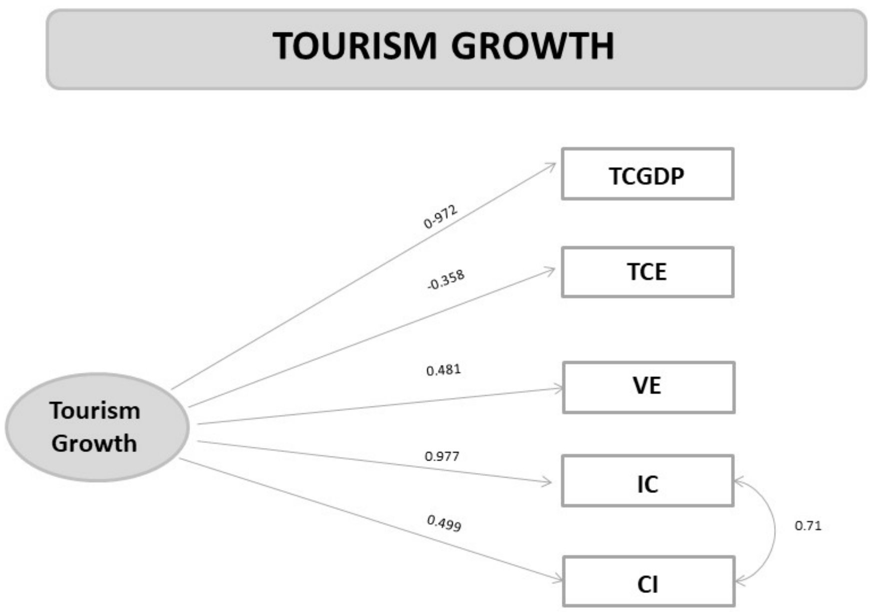


**Figure 2.** Standardised solution for the confirmatory structural model of tourism growth

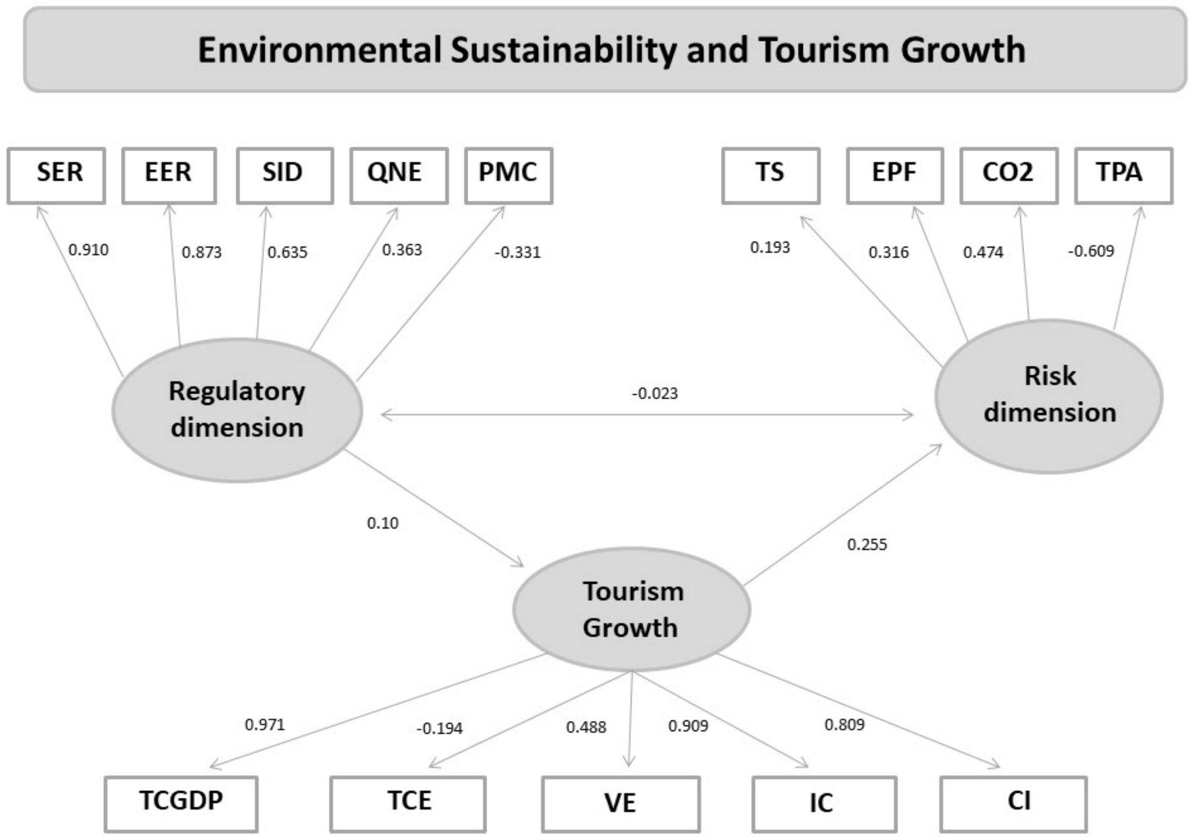


**Figure 3.** Standardised solution for the structural model of environmental sustainability and tourism growth

**Highlights**

- Thirty years after the Brundtland Report the debate on sustainable tourism is current.
- Sustainability is considered a key element for touristic competitiveness.
- There has been an effort to show how sustainability contributes to tourism growth.
- An improvement in sustainability contributes, partially, to the growth of tourism.
- Stakeholders should work towards environmental sustainability.

**Table 1**
Variables used to measure environmental sustainability at the country level

| | | |
|---|---|---|
| World Economic Forum | SER<br>Stringency of environmental regulation | How would you assess the stringency of your country's environmental regulations? (Value: 1 very lax - 7 among the world's most stringent). |
| | EER<br>Enforcement of environmental regulation | How would you assess the enforcement of environmental regulations in your country? (Value: 1 very lax - 7 among the world's most rigorous). |
| | SID<br>Sustainability of T&T industry development | How would you assess the effectiveness of your government's efforts to ensure that the T&T sector is being developed in a sustainable way? (Value: 1 very ineffective - 7 very effective). |
| | TS<br>Threatened species | Threatened species as a percentage of total species: mammals, birds, amphibians. (0-100%). |
| | ETR<br>Environment treaty ratification | Total number of ratified environmental treaties. (Value: 0–25). |
| | WHN<br>Number of World Heritage natural sites | Number of World Heritage natural sites in the country. (Value). |
| | QNE<br>Quality of the natural environment | How would you assess the quality of the natural environment in your country? (Value: 1 extremely poor - 7 among the world's most pristine). |
| | TKS<br>Total known species | Total known species: mammals, birds, amphibians in the country. (Value). |
| World Bank | PMC<br>Particulate matter concentration | Urban population–weighted (Value: value µg/m³, 10 micrograms per cubic meter). |
| | EPF<br>Electricity production from oil, gas, and coal sources | Sources of electricity refer to the inputs used to generate electricity. (0-100% of total). |
| | $CO_2$<br>$CO_2$ emissions | Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. (Value: metric tons per capita). |
| | TPA<br>Terrestrial protected areas | Terrestrial protected areas are totally or partially protected areas of at least 1,000 hectares that are designated by national authorities as scientific reserves with limited public access, national parks, natural monuments, nature reserves or wildlife sanctuaries, protected landscapes, and areas managed mainly for sustainable use. (% of total land area). |
| | MPA<br>Marine protected areas | Marine protected areas are areas of intertidal or sub-tidal terrain – and overlying water and associated flora and fauna and historical and cultural features – that have been reserved by law or other effective means to protect part or all of the enclosed environment. (% of territorial waters). |

Source: Authors' own elaboration based on World Economic Forum (2017) and World Bank (2017) sources.

**Table 2**
Variables used to measure tourism growth at the country level

| | |
|---|---|
| TCG<br>Total Contribution to GDP | GDP generated by direct Travel & Tourism industries plus indirect and induced contributions, including the contribution of capital investment spending. (Billions of US dollars, at current prices and exchange rates). |
| TCE<br>Total Contribution to Employment | The number of jobs generated directly in the Travel & Tourism industry plus indirect and induced contributions. (Thousands of persons). |
| VE<br>Visitor Exports | Spending within the country by international tourists for both business and leisure trips, including transportation spending. (Billions of US dollars, at current prices and exchange rates). |
| IC<br>Internal Travel & Tourism Consumption | Total revenue generated within a country by industries that deal directly with tourists including visitor exports, domestic spending, and government individual spending. This does not include spending abroad by residents. (Billions of US dollars, at current prices and exchange rates). |
| CI<br>Capital Investment | Capital investment spending by all sectors directly involved in the Travel & Tourism industry. This also constitutes investment spending by other industries on specific tourism assets such as new visitor accommodation, passenger transportation equipment, as well as restaurants and leisure facilities for specific tourism use. (Billions of US dollars, at current prices and exchange rates). |

Source: Authors' own elaboration based on World Travel & Tourism Council (2017) sources.

**Table 3**
Statistical summary of the variables used to measure tourism growth and environmental sustainability

| Variables | 2007 | | 2016 | | Differences | | 95% CI for the mean of differences* | |
|---|---|---|---|---|---|---|---|---|
| | Mean | S.E. | Mean | S.E. | Mean | S.E. | Lower Limit | Upper Limit |
| TCGDP | 36.262 | 10.005 | 43.492 | 11.983 | 7.230 | 2.992 | 2.765 | 14.559 |
| TCE | 1781.999 | 584.617 | 1690.454 | 536.131 | -91.545 | 72.995 | -259.904 | 12.350 |
| VE | 6.801 | 1.300 | 8.271 | 1.526 | 1.469 | 0.389 | 0.792 | 2.334 |
| CI | 4.486 | 1.354 | 5.175 | 1.349 | 0.689 | 0.377 | -0.030 | 1.486 |
| IC | 25.613 | 7.168 | 30.662 | 8.121 | 5.049 | 2.195 | 1.835 | 10.268 |
| SER | 3.971 | 0.094 | 4.107 | 0.098 | 0.201 | 0.045 | 0.114 | 0.290 |
| EER | 3.807 | 0.089 | 3.836 | 0.096 | 0.086 | 0.043 | -0.002 | 0.173 |
| SID | 4.695 | 0.069 | 4.335 | 0.074 | -0.310 | 0.048 | -0.403 | -0.221 |
| QNE | 4.601 | 0.076 | 4.453 | 0.088 | -0.111 | 0.060 | -0.227 | 0.005 |
| ETR | 17.660 | 0.350 | 19.320 | 0.260 | 1.934 | 0.238 | 1.525 | 2.451 |
| WHN | 1.410 | 0.210 | 1.560 | 0.230 | 0.202 | 0.047 | 0.113 | 0.306 |
| TKS | 729.100 | 51.830 | 760.140 | 50.920 | 34.903 | 12.127 | 12.599 | 60.804 |
| PMC | 48.840 | 3.270 | 37.597 | 2.170 | -9.902 | 1.401 | -12.654 | -7.105 |
| EPF | 61.537 | 3.059 | 61.511 | 2.986 | -0.026 | 0.669 | -1.323 | 1.272 |
| CO2 | 5.655 | 0.645 | 5.371 | 0.524 | -0.284 | 0.146 | -0.601 | -0.041 |
| TPA | 13.083 | 0.868 | 17.110 | 0.981 | 3.946 | 0.568 | 2.922 | 5.157 |
| MPA | 6.990 | 1.109 | 13.277 | 1.892 | 6.419 | 1.619 | 3.561 | 10.032 |
| TS | 6.206 | 0.436 | 6.568 | 0.441 | 0.245 | 0.220 | -0.098 | 0.749 |

* Bootstrap method for estimation (since the normality assumption was not met)

**Table 4**
Parameter estimates from the structural equation model for environmental sustainability and tourism growth

| | Variables | Estimate | Std.err | Z-value | P(>\|z\|) | Standardised estimate |
|---|---|---|---|---|---|---|
| Latent | Tourism Growth | | | | | |
| | TCGDP | 1.132 | 0.286 | 3.963 | 0.000 | 0.971 |
| | TCE | -0.228 | 0.125 | -1.820 | 0.069 | -0.194 |
| | VE | 0.564 | 0.172 | 3.285 | 0.001 | 0.488 |
| | IC | 1.061 | 0.275 | 3.863 | 0.000 | 0.909 |
| | CI | 0.947 | 0.275 | 3.446 | 0.001 | 0.809 |
| | Regulatory dimension | | | | | |
| | SER | 0.873 | 0.131 | 6.664 | 0.000 | 0.910 |
| | EER | 0.820 | 0.120 | 6.853 | 0.000 | 0.873 |
| | SID | 0.655 | 0.108 | 6.044 | 0.000 | 0.635 |
| | QNE | 0.346 | 0.076 | 4.555 | 0.000 | 0.363 |
| | PMC | -0.291 | 0.068 | -4.250 | 0.000 | -0.331 |
| | Risk dimension | | | | | |
| | EPF | 0.306 | 0.072 | 4.280 | 0.000 | 0.316 |
| | CO2E | 0.234 | 0.063 | 3.707 | 0.000 | 0.474 |
| | TPA | -0.607 | 0.127 | -4.772 | 0.000 | -0.609 |
| | TS | 0.200 | 0.060 | 3.332 | 0.001 | 0.193 |
| Regressions | Tourism | | | | | |
| | Regulatory dimension | 0.096 | 0.032 | 3.009 | 0.003 | 0.096 |
| | Risk dimension | | | | | |
| | Tourism | 0.263 | 0.075 | 3.486 | 0.000 | 0.255 |
| Covariance | Regulatory dimension | | | | | |
| | Risk dimension | -0.023 | 0.076 | -0.295 | 0.768 | -0.023 |

**Table 5**
Classification of countries according to their level of tourism growth during the period 2007–2016

| **HTG Cluster (high tourism growth)** | | **MTG Cluster (medium tourism growth)** | | |
|---|---|---|---|---|
| United Arab Emir. | Indonesia | Argentina | Sri Lanka | Venezuela |
| Australia | India | Azerbaijan | Mexico | Vietnam |
| Brazil | Italy | Switzerland | Malaysia | South Africa |
| China | Japan | Chile | Pakistan | |
| Germany | Netherlands | Colombia | Panama | |
| Spain | Russian Federation | Algeria | Peru | |
| France | Singapore | Egypt | Philippines | |
| United Kingdom | Thailand | Israel | Saudi Arabia | |
| Greece | Turkey | Kazakhstan | Sweden | |
| Hong Kong | United States | Korea, Rep. | Uruguay | |
| **LTG Cluster (low tourism growth)** | | | | |
| Albania | Costa Rica | Hungary | Mongolia | Romania |
| Armenia | Czech Republic | Ireland | Mozambique | Senegal |
| Austria | Denmark | Jamaica | Namibia | El Salvador |
| Belgium | Dominican Rep. | Kenya | Nigeria | Slovak Republic |
| Benin | Ecuador | Kyrgyz Republic | Nicaragua | Slovenia |
| Bangladesh | Estonia | Cambodia | Norway | Tanzania |
| Bulgaria | Ethiopia | Kuwait | Nepal | Ukraine |
| Bosnia and Herzeg. | Finland | Lithuania | New Zealand | Zambia |
| Bolivia | Georgia | Latvia | Oman | Zimbabwe |
| Botswana | Guatemala | Morocco | Poland | |
| Canada | Honduras | Moldova | Portugal | |
| Cameroon | Croatia | Macedonia, FYR | Paraguay | |

**Table 6**
Countries not classified (excluded due to missing values)

| | | | |
|---|---|---|---|
| Angola | Guyana | Mali | Suriname |
| Burkina Faso | Haiti | Malta | Swaziland |
| Bahrain | Iran, Islamic Rep. | Montenegro | Seychelles |
| Barbados | Iceland | Mauritius | Syria |
| Brunei Darussalam | Jordan | Malawi | Chad |
| Cote d'Ivoire | Lebanon | Puerto Rico | Tunisia |
| Costa Rica | Libya | Qatar | Uganda |
| Ghana | Lesotho | Rwanda | Yemen |
| Guinea | Luxembourg | Sierra Leone | |
| Gambia | Madagascar | Serbia | |

**Table 7**
Summary of the results for the change in 2016 from 2007 for environmental and tourism variables by cluster classification. Paired cluster comparison for each of the variables considered in the model. Statistical tests and confidence intervals are obtained using a bootstrap method

| | Cluster HTG | | Cluster MTG | | Cluster LTG | | p-values for paired comparisons (Sidak correction) | | |
|---|---|---|---|---|---|---|---|---|---|
| Changes over time | Mean (SD) | 95% CI | Mean (SD) | 95% CI | Mean (SD) | 95% CI | "HTG-MTG" | "HTG-LTG" | "MTG-LTG" |
| TCGDP | 38.073(18.705) | (7.925; 79.334) | 7.434(0.824) | (5.939; 9.208) | 0.718(0.144) | (0.438; 1.015) | **0.030** | **0.001** | 0.857 |
| TCE | -606.115(483.898) | (-1715.79; 68.25) | -20.674(55.071) | (-138.666; 80.853) | -5.223(11.938) | (-29.199; 17.936) | 0.139 | **0.052** | 0.999 |
| VE | 6.946(2.371) | (2.816; 12.334) | 1.66(0.5) | (0.822; 2.838) | 0.291(0.052) | (0.192; 0.399) | **0.002** | **0.000** | 0.587 |
| CI | 3.383(2.569) | (-1.503; 8.491) | 0.96(0.217) | (0.536; 1.422) | 0.036(0.057) | (-0.072; 0.152) | 0.342 | **0.044** | 0.854 |
| IC | 26.359(12.933) | (5.325; 54.735) | 5.391(0.628) | (4.145; 6.557) | 0.511(0.103) | (0.317; 0.721) | **0.033** | **0.001** | 0.841 |
| SER | 0.114(0.104) | (-0.094; 0.329) | 0.054(0.124) | (-0.188; 0.306) | 0.228(0.057) | (0.12; 0.345) | 0.966 | 0.733 | 0.361 |
| EER | -0.004(0.101) | (-0.203; 0.194) | -0.086(0.106) | (-0.29; 0.13) | 0.143(0.056) | (0.038; 0.254) | 0.914 | 0.526 | 0.130 |
| SID | -0.396(0.095) | (-0.599; -0.221) | -0.38(0.121) | (-0.629; -0.157) | -0.267(0.075) | (-0.42; -0.124) | 0.999 | 0.741 | 0.781 |
| QNE | 0.312(0.12) | (0.084; 0.57) | -0.18(0.137) | (-0.468; 0.081) | -0.109(0.076) | (-0.259; 0.034) | **0.027** | **0.025** | 0.952 |
| PMC | -11.748(3.336) | (-18.97; -6.083) | -12.716(2.83) | (-18.227; -7.329) | -7.126(1.518) | (-10.253; -4.009) | 0.993 | 0.423 | 0.221 |
| EPF | -2.459(1.096) | (-4.58; -0.335) | 1.833(1.178) | (-0.537; 4.225) | -1.057(1.14) | (-3.046; 1.464) | 0.171 | 0.849 | 0.311 |
| CO2 | -0.605(0.264) | (-1.164; -0.104) | 0.295(0.103) | (0.121; 0.526) | -0.128(0.107) | (-0.341; 0.07) | **0.003** | 0.099 | 0.137 |
| TPA | 4.417(1.488) | (1.922; 7.794) | 1.401(0.364) | (0.731; 2.179) | 5.251(1.15) | (3.075; 7.572) | 0.443 | 0.960 | 0.099 |
| TS | 1.205(1.266) | (-0.424; 4.106) | 0.351(0.218) | (-0.101; 0.773) | -0.187(0.121) | (-0.43; 0.049) | 0.636 | 0.121 | 0.789 |