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Title: Evaluation of the Determinants Factors of Innovation in Colombian Tourist Product.

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Introduction

Receipts from international tourism in destinations around the world grew by 4% in 2012 reaching US\$ 1075 billion. This growth is equal to the 4% increase in international tourist arrivals which reached 1035 million in 2012, UNWTO (2013). Despite the positive development of tourism in different countries, based on the both economy and social development, is facing problems of productivity and growth. Consequently, innovation as a driver of growth is destined to be the answer (Pechlaner et al 2006; Sancho, Gonzalo and Rico, 2004; Bieger, 2005; Flagestad, 2005; Hjalager, 2002, Keller, 2005). The development of marketable innovative both products and services is one of the most discussed topics in the science and practice of tourism at this time (Pechlaner et al 2006). In Colombia, the empirical evidence on innovation research in tourism is extremely limited, Zuniga, Castillo and Chim, (2012). Consequently, is very important to develop more studies on tourism in this Country, Zúñiga and Castillo, (2012).

Literature review

The concept of innovation identified in the literature is varied, the definitions described depend on the objects of research, however, highlights the definition proposed by Kanter, cited by Hall & Willan (2008) and Hjalager (2010), which reads: "Innovation refers to the process of bringing any new, problem solving idea into use. Ideas for reorganizing, cutting cost, putting in new budgetary systems, improving communication or assembling products in teams are also innovations. Innovation is the generation, acceptance and implementation of new ideas, processes, products or services. Acceptance and implementation is central to this definition; it involves the capacity to change and adapt". On the other hand, OECD & Eurostat (2005), through the Oslo Manual describes four types of innovation, where companies can make numerous changes in its working methods, in the use of production factors and their types products to improve their productivity and/or business performance, and divided as follows: 1) Product Innovations. Which involve significant changes in the characteristics of the goods or services, meaning new products and improved of existing products, 2) Process Innovations. Refers to significant changes in the methods of production and

distribution, 3) Organizational Innovations. To refer to the implementation of new methods of organization. These include changes in business practices in workplace or external relations of the company. And finally, 4) Marketing Innovations. Which refer to all practices or developing new marketing processes, marketing and selling products or services.

The purpose of this study is to analyze the relationship between innovation in Colombian tourist product (ICTP) using the conceptual variable: product innovation, according to that described by [OECD and Eurostat \(2005\)](#), and the explicative variables used by [Galvez, \(2012\)](#) to measure innovation product:

Methodology

In order to validate the hypothesis has opted for the application of regression analysis. According to [Aldás \(2008\)](#), cited by [Escobar \(2012\)](#), regression analysis is a statistical technique used to analyze the relationship between a single dependent variable and several independent. The objective of this technique is to use the independent variables with known values to predict the dependent variable. Each independent variable is weighted by coefficients that indicate the relative contribution of each of the dependent variables to explain.

Thus, Regression Analysis can be used for two purposes: Firstly, can explain the relationship of one variable with others, or Second, for purposes Predictive when can estimate the behavior of a variable based on what is known of other variables that influence their behavior. Therefore, this statistical technique is best suited to meet the study objective, related to the determination of the key factors that explain the implementation of product innovation in Colombian companies that develop products and tourism services.

Specifically, data from the empirical study are part of the doctoral thesis of Candidate of scientific perspectives in tourism and Management in tourism companies ULPGC of Spain, Alexander Zuniga-Collazos, whose research has been conducted in order to analyze the innovation in tourism businesses Colombian and its impact on performance.

In this study this technique could explain the relationship between the independent variables and the ICPT, or predictive purposes, or predictive purposes, when can estimate behavior of PTCI with the knowing of the other independent variables that influence their behavior. Therefore, it is very appropriate statistical technique to determine which independent variables relate to the ICPT.

The suggested model has the following structure determined by the dependent variable: Innovation in Colombian Tourism Product (ICTP), and the independent variables $InnPrd_1$ to $InnPrd_3$ which are explained later.

$$ICTP = InnPrd_1 + InnPrd_2 + InnPrd_3$$

Where, $InnPrd_1$ = Changes or improvements to existing products or services

$InnPrd_2$ = Commercialization of new products or services

$InnPrd_3$ = Research and Development to create new products

So, to explain the determinants of innovation in Colombian tourist product (ICTP), were used measurement items described by [OECD and Eurostat \(2005\)](#) and raised by [Galvez, \(2011\)](#) and [Jiménez-Jiménez Daniel y Sanz-Valle Raquel \(2011\)](#), which could help increase the results of the ICTP.

The independent variables that will be used justifies its importance in the study as follows:

- **InnPrd₁** (Changes or improvements to existing products or services): This variable could influence the ICPT in the extent that Colombian tourism companies make changes or improvements to existing products or tourism services.
- **InnPrd₂** (Commercialization of new products or services): this variable can be influential in the PTCI, due to the growth of tourism in Colombia, and therefore competition Colombian companies that sell products or tourism services.
- **InnPrd₃** (Research and Development to create new products): This variable can be very important, because it can be an indicator in a developing country, where apparently many companies, especially in companies that sell tourism products and services, and do little research and development.

A survey was designed and applied to a representative sample of 364 Managers; the tourism enterprises were located in the cities of: Medellin, Antioquia; Calarca, Quindío, Popayan and Santander de Quilichao, Cauca.

Descriptive analysis of the sample.

As indicated in the data sheet (see Table 1) research has been conducted based on a national sample of 364 Managers of the Colombian tourism companies that assessed the level of innovation in tourism product they develop.

Table 1. Sample Technical.

Sample	364
Margin of sampling error	1%
Method of collecting information	Personal survey using a structured questionnaire
Sampling process	Aleatory
Date of fieldwork	November-December 2012

Source: empirical work of Zúñiga-Collazos, (2013).

Data collected for the study contain a sample of 364 observations belonging to different tourism businesses such as: hotels, restaurants, travel agencies and companies providing hosting services, leisure and recreation in the cities of: Medellin, which is the second largest city in Colombia, due to its economic development and commerce, highlighting the development of cultural tourism and business, is the capital of the Department of Antioquia, and is located to the north- east of Colombia. Popayan, historic city and recognized as having different types of tourism: especially religious tourism, historic and culture tourism, is the capital of the department of Cauca, and is located south- west of Colombia. Santander de Quilichao is a small town, and whose main characteristic is its strategic location is among one of the important corridors in the southwest of Colombia, being a stopping point, and tourism to travelers, is located north Cauca department. Finally Calarca, is a small town located in the department of Quindio, located in the center of the country, and is home to the Colombian coffee zone, one of the departments most developed in tourism as: theme parks, eco-tourism, nature tourism and rural tourism.

In the sample the highest percentage (55.7 %) belongs to the restaurants, followed by hotels (20.3 %), Other Hosting utilities (6.6 %), Travel Agencies (3.8 %) and others (13.46 %), which are companies that provide leisure and recreation, such as: theme parks, resorts, clubs, bars, etc. (See Table 2).

Table 2. Sub-Sector Sample

Sector	Frequency	Percent
Hotel	74	20.33
Restaurant	203	55.77
Travel Agencies	14	3.85
Hosting	24	6.59
Others	49	13.46

Total	264	100
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Source: empirical work of Zúñiga-Collazos, (2013)

Table 3. Number of employees

Employees	Frequency	Percent
Between 1-10	302	82.97
Between 11-20	38	10.44
Between 21-50	18	4.95
More than 50	6	1.65

Source: empirical work of Zúñiga-Collazos, (2013)

As can be seen in Tables 3 and 4, the surveyed companies are small and medium enterprises (SMEs). According to the Ministry of Commerce, Industry and Tourism of Colombia, (2013), by firm size, the sample would be classified as follows: 0-10 micro workers (82.97%), small business workers 11-50 (15.39 %), and medium enterprises 51-200 employees (1.61%), however, it is interesting to note that even though the sample shows a large majority of micro and small companies, more than half of the sample, are businesses established in the tourism sector, with more than 4 years (57.58%) and 15.43% are companies that are between 2.1 and 4 years of establishment in the market, but it is also important to note that 27% of companies are in a stage start-ups with less than two years on the market.

Table 4. Time on Market.

Time	Frequency	Percent
Between 0-2 years	98	27.00
Between 2.1-4 years	56	15.43
More than 4 years	209	57.58
Total	364	100

Source: empirical work of Zúñiga-Collazos, (2013).

Analysis of Results and Discussion.

Adoption of Innovation in Product in Colombian tourist companies (ICPT):

Table 5. Descriptive Statistics

	N	Minimum	Maximum	Average	Deviation
ICPT	364	0	3	2,26	,757
InnPrd ₁	364	0	5	3,66	1,755
InnPrd ₂	364	0	5	2,75	2,173
InnPrd ₃	364	0	5	2,16	2,202
Valid N (listwise)	364				

Source: Authors.

The implementation of product innovation programs in Colombian tourist companies is a relatively emerging practice (See Table 5), and according to the results, companies spend little effort yet. This is justified discriminately for each of the dimensions of product innovation assessed, so:

InnPrd₁: Innovation understood from efforts to make changes or improvements in existing products had an average rating of 3.66 out of 5.0, by entrepreneurs, thus indicating that the level of changes or improvements in its products is being carried out in a

priority for all companies surveyed. Likewise, reviewing the minimum and maximum obtained, it appears that there are companies that have pleaded not make any effort in this direction, and others who have done the best to contribute to this task, so that not all have the same level of intent to innovate from the generation of changes in existing products.

InnPrd₂: Innovation understood from entrepreneurial efforts to commercialize new products or services has had an average rating of 2.75 out of 5.0, on the part of employers, indicating that the level of commercialization of new products are not being carried out as a priority in all companies surveyed, and compared to the generation of improvements in existing products is not a task to run greater extent. Likewise, reviewing the minimum and maximum obtained, it appears that there are companies that have pleaded not make any effort in this direction, and others have made many efforts to do so, so that not all have the same level of intent to commercialize both new tourism products and services.

InnPrd₃: Innovation understood from efforts to implement research and development to create new products has had an average score of 2.16 to 5.0, by entrepreneurs, thus indicating that the level of R & D efforts to develop new tourism products is not being carried out as a priority in all companies surveyed. Also, compared with tasks such as generating improvements in existing products or marketing of both new products and services, is a task that is executed by less than two, which allows us to understand that priorities by product Innovation, R & D is the least interest in its current development in Colombian tourism companies. Likewise, reviewing the minimum and maximum obtained, it appears that there are companies that have pleaded not make any effort in this direction, and others have made many efforts to do so, so that not all have the same level of intent to run for R & D to create new products.

Influence of the Dimensions of Product Innovation in the Colombian Tourism Product

According to the results presented in the correlation matrix (See Table 6), it can be seen that the variables InnPrd₁, InnPrd₂, InnPrd₃, have a significant relationship with respect to the Variable: Innovation in Colombian Product Tourist (ICTP), and that these relationships are positive, as show their coefficients.

Table 6 shows a positive linear relationship with the dependent variable ICTP with each of the independent variables, so that InnPrd₃ (Research and Development to create new products) and InnPrd₂ (changes or improvements in existing products) are the variables that contribute most to the model to the extent that they are those that have a higher correlation coefficients.

Table 6. Correlation Matrix.

		ICTP	InnPrd ₁	InnPrd ₂	InnPrd ₃
ICTP	Correlation of Person	1	,698	,550	,752
	Sig. (bilateral)		,000	,000	,000
	N	364	364	364	364
InnPrd ₁	Correlation of Person	,698	1	,495	,368
	Sig. (bilateral)	,000		,000	,000
	N	364	364	364	364
InnPrd ₂	Correlation of Person	,550	,495	1	,550
	Sig. (bilateral)	,000	,000		,000
	N	364	364	364	364
InnPrd ₃	Correlation of Person	,752	,368	,550	1
	Sig. (bilateral)	,000	,000	,000	
	N	364	364	364	364

Source: Authors.

**Correlation is significant at the 0.01 level (bilateral).

However, we discuss later the abstract model, and initially we stop reading those indicators that are useful for testing the applicability conditions (evaluation of the correlation of waste, multicollinearity problem assessment, evaluation of the normality, and Outliers detection, Escobar (2012), cited by Aldás (2008)).

Table 7. Summary of the Model.

Model	R	R Squared	R Squared Corrected	R Standard error of the estimate	Durbin-Watson
1	,878 ^a	,771	,769	,364	1,563

Source: Authors.

a. Predictors: (Constant), InnPrd₃, InnPrd₁, InnPrd₂

b. Dependent Variable: ICTP

With respect to the evaluation of the correlation of the residues may be highlighted the problem to evaluate the Durbin-Watson indicator obtained in Table 8, is close to zero: 1,563. It is also important to note the high significance of the model, expressed in the table of ANOVA obtained (see Table 8).

Table 8. ANOVA Analysis for the proposed model.

Model		Sum of Squares	gl.	Mean Square	F	Sig.
1	Regression	160,523	3	53,508	403,980	,000 ^a
	residual	47,683	360	,132		
	total	208,206	363			

Source: Authors. a. Predictors: (Constant), InnPrd₃, InnPrd₁, InnPrd₂; b. Dependent Variable: ICTP

Due to the multicollinearity problem assessment (situation in which several of the Dependent Variables are strongly correlated with each other causing it to be difficult to isolate the effect of individual variables), one of the methods to detect is evaluating the tolerance index. Then, we analyze an independent variable on the other and calculate the R². 1-R² is tolerance. Values close to 1 imply that there is no linear relationship between the independent variable and the rest. (Escobar, (2012) cited by Aldás, (2008)).

As can be seen in the coefficient matrix (See Table 9), there are no problems of multicollinearity, because for each of the variables, their tolerance indicator is NOT less than 0.10, as suggested by the theory of Menard (1995), cited by Aldás, (2008).

Table 9. Matrix of coefficients

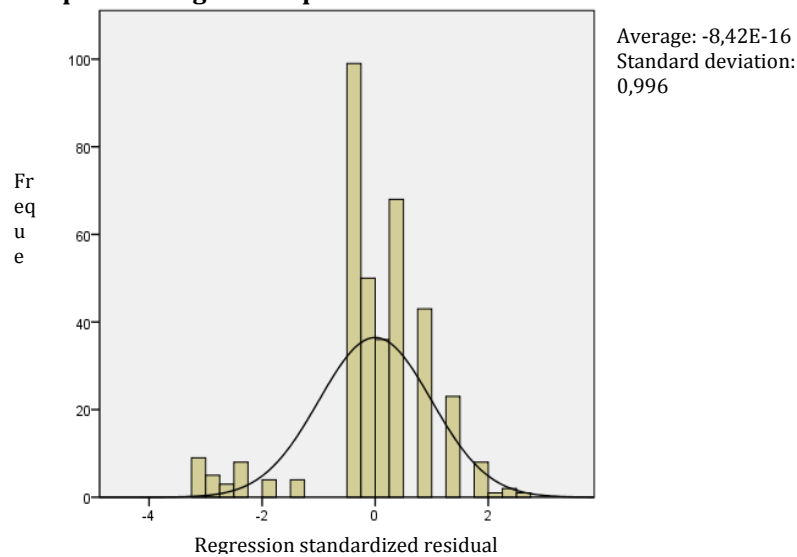
Model	Unstandardized Coefficients		Typified Coefficients	t	Sig.	Statistical collinearity		
	B	Typ. error	Beta			Tolerance	FIV	
1	(Constant)	1,067	,045					
	InnPrd ₁	,212	,013	,491	16,753	,000	,742	1,348
	InnPrd ₂	-,004	,011	-,010	-,320	,749	,599	1,671
	InnPrd ₃	,199	,010	,578	18,963	,000	,686	1,458

Source: Authors.

Note: a. Dependent Variable: ICTP

Furthermore, the common way to check the normality is through the histogram view. In Graph 1, we can see that the errors are normally distributed satisfactory.

Graph 1. Histogram. Dependent Variable ICTP.



Source: Authors.

Finally, for the detection of outliers was calculated Mahalanobis distance and its significance, using the method suggested by Aldás (2008) and according to the analysis, none of the analyzed data shows a statistically significant Mahalanobis distance ($p < .001$) to infer the existence of an outlier.

Estimation of the model:

First we evaluate the significance of the model. Then performed an initial evaluation of the joint significance:

Given that we have the model:

$$ICTP = C + \beta_1 InnPrd_1 + \beta_2 InnPrd_2 + \beta_3 InnPrd_3$$

Should discard all $\beta \neq 0$ to determine that all variables explain the model.

Then,

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0 \text{ and:}$$

$$H_1: \text{some } \beta \neq 0$$

Is checked again outputs ANOVA analysis (see Table 8), shows that the significance level for the F test of the regression is 0.000, which is lower than 0.05 which is the minimum level of significance expected, therefore the hypothesis H_0 is rejected, and must be at least some $\beta \neq 0$, and thus at least some of the independent variables explain the behavior of the dependent variable ICTP.

Subsequently the significance of the parameters is evaluated individually. For this t-test is evaluated in the coefficient matrix, taking into account the hypothesis:

$H_0: \beta_j = 0$ and:

$H_1: \beta_j \neq 0$

According to Table 9 (Matrix of coefficients), InnPrd₁ (Changes or improvements in both existing products and services) and InnPrd₃ (Research and Development to create new products) have a significant individual significance within the model, and therefore could argued that the variables that contribute to it. By contrast, InnPrd₂ (Marketing of both new products and services), should be discarded according to the first analysis, because it is not considerably significant for the analysis of dependent variable.

With respect to the goodness of fit of the model, we can say that with a corrected R^2 of 0.769, the model is explaining 76.9% of the information with the variables used, namely InnPrd₁ and InnPrd₃. While the remaining 23.1% of the information can be explained by other variables that have not been taken into account in the model.

Once the model is estimated and diagnoses that confirm the validity of the results, the regression line obtained from the coefficient matrix (Table 9) is:

$$ICTP = 1.067 + 0,212 \cdot InnPrd_1 + 0.199 \cdot InnPrd_3$$

With this equation, you can predict the level of innovation in the tourism product that will have a particular company, if we know about their perceptions.

But also to predict the degree of innovation of Colombian tourism product, the regression coefficients also allow identifying the relative importance of individual variables to predict. In this case it is clear that the variable InnPrd₁ (Changes or improvements in both existing products and services) is the most important (0.212) followed closely by InnPrd₃ (Research and Development to create new products) (0.199).

The study results are summarized in Table 10:

Table 10. Regression Results.

	B	Stand. Error	β
Constant	1.067	0.045	
InnPrd ₁	0.212	0.013	0.491**
InnPrd ₂	-0.004	0.011	-0.10
InnPrd ₃	0.199	0.010	0.578**

Source: Authors.

Note: $R^2 = 0.77$; ** $p < 0.01$

Conclusions

According by outputs ANOVA analysis (see Table 8), shows that the significance level for the F test of the regression is 0.000, which is lower than 0.05 which is the minimum level of significance expected, therefore the hypothesis H_0 is rejected, and must be

at least some $\beta \neq 0$, and thus at least some of the independent variables explain the behavior of the dependent variable Innovation in Colombian Tourism Product (ICTP).

With respect to the goodness of fit of the model, we can say that with a corrected R^2 of 0.769, the model is explaining 76.9% of the information with the variables used, namely InnPrd₁ and InnPrd₃. While the remaining 23.1% of the information can be explained by other variables that have not been taken into account in the model.

The main conclusion of this study was the observation a significant relationship with respect to the Variable: Innovation in Colombian Product Tourist (ICTP) with the variables InnPrd₁ (0,698**), InnPrd₂ (0,550**), InnPrd₃ (0,752**), and that these relationships are positives, as show their coefficients. Especially exists a positive linear relationship between the dependent variable ICTP with the independent variables: InnPrd₃ (Research and Development to create new products) and InnPrd₁ (changes or improvements in existing products) that are the variables that most contribute to the model.

But also to predict the degree of innovation of Colombian tourism product, the regression coefficients also allow identifying the relative importance of individual variables to predict. In this case it is clear that the variable InnPrd₁ (Changes or improvements in both existing products and services) is the most important (0.212) followed closely by InnPrd₃ (Research and Development to create new products) (0.199).

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