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The Ecuadorian Tourism Sector: Smart Tourism Initiative and the Impact in the Economy of Ecuador

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Abstract

Technological advances have not only ventured to efficiently boost industrial production. In recent years it has helped improve the provision of services both in person and remotely. This document analyzes the advantages that the use of these technological instruments has provided. In favor of the Ecuadorian tourism sector, the empirical evidence agrees on a positive relationship between technology and tourism; Using generalized least squares econometric models to obtain a reliable and concise estimate determines the existence of a positive relationship of variables in the Ecuadorian case within the last 15 years. However, as there is a long way to go, the work of both the Public authorities and private sector actors must be consolidated in terms of infrastructure, training and innovation to obtain positive effects for society in general.

Keywords: Tourism Growth, Technology, Econometrics, Ecuador, Smart Tourism.

Introduction

Tourism is seen as a great propulsor for economic growth and development due to its positive influence in the economy in terms of internal revenue, job creation, fiscal revenue, and increase on foreign exchange (Bengare et al, 2021). Tourism is on the rise, and its role in the country's economic and employment growth is greatly valued. The demand on tourism has further increased due to the rapid development of information technologies such as cloud storage and smart mobile terminals, which have opened the way for smart tourism (Zhang & Dong, 2021). The touristic economic sector represents 26% of the GDP in the Caribbean, and 10% in Latin America (CEPAL, 2020). Tourism provides a means of living for millions of people, and at the same time allows them to appreciate different cultures as well as their own culture. Similarly, environmental economy represents more than 20% of some countries' GDP. Generally speaking, tourism is considered the 3rd most important economic in the world. However, is has been one of the economic fields that have been the most affected by the COVID-19 pandemic, which is why it is necessary to prioritize all necessary means of production within the touristic sector. The reconstruction of this economic sector also offers the opportunity to transform it to create more resilient businesses and communities through innovation, digitalization, or sustainability (ONU, 2020); tourism represents one of the largest income sources in Ecuador, which is why it has been considered one of the economic sectors with the highest priority within the program "Transformar La Matriz Productiva Para Alcanzar el Ecuador del Buen Vivir," created by the Ecuadorian National Government through the National Secretary of Planning and Development.

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Ecuador is considered as a mega-diverse touristic destiny worldwide, which main touristic attraction is its many modalities related to Ecuador's offer in natural and cultural resources, and ecological reserves; for this reason tourism has become one of the main tools for economic strengthening. These are some of the reasons for Ecuador to promote itself as a sustainable touristic destiny. On the other hand, more than 80% of users count with access internet, however Ecuador is in a process of development and reducing the digital gap directed mainly to the creation and consumption of digital content and information, given that the use of internet is mainly focused on social media instead of news and information; the increase of internet access is being justified by the amount of active cellphone lines, access to public areas, and the availability of mobile providers (Del Alcazar, 2022).

It is important to emphasize the issue of digital illiteracy. A person between the ages of 15 and 49 who does not have an activated cell phone and who does not use a computer or the Internet is considered to be digitally illiterate. In the 2019-2020 period, there was a decrease of 1.2 percentage points at the country level and 3.2 percentage points in the rural area, with the variation in the urban population not being significant. Likewise, in 2020 the variation in digital illiteracy for men turned out to be significant; while for women it was not significant (INEC, 2021).

In this context, Cantillo & Patiño (2020) indicate that the touristic sector, with the aid of Information Technology, has evolved significatively, given that currently, touristic demand is known thanks to internet access, with the digital market being a strategic element for these organizations. Similarly, Urvina et al. (2022) mentions that the TICs have changed tourist's travel patterns and behavior through the use of mobile applications that allows them to remain informed; Ballina et al. (2019) reveals that in addition to the globalization of touristic markets, the development of new technologies are key elements for tourism, especially in rural areas, while in urban areas it is less important; Cervantes et al. (2023) highlights that despite the separation between the public and private sector in the touristic promotion, the internet has aided the supply this need for the touristic industry due to the digitalization of the relationship between supply and demand through digital platforms and social media.

In this context, the general objective of this research is to estimate and analyze the effects of new technological trends in relation to the growth of the tourism sector in Ecuador, through an econometric strategy for panel data, considering 21 provinces of Ecuador and a period of 14 years (2008-2021), in order to determine the relationship between the use of ICT and the added value of the accommodation and food service sector; authors such as Vilaseca et al. (2006), Bambauer-sachse & Mangold (2011), Shengnan et al. (2012), among others, stress the support of new technologies in the economic, organizational and social development of the regions in which the tourist activity is the livelihood of the population; Empirically, the results consider that both the use of the computer, the Internet and social networks expand the coverage of companies' services, increasing the number of potential consumers-visitors not only nationally but also internationally.

Literature Review

In the context of the contributions of new technologies in the development of tourist activities, Vilaseca et al. (2006) analyzes the effects of the use of ICTs in the tourism industry of the Autonomous Community of Catalonia, by conducting surveys to 2038 Catalan tourism companies in the period of January and May 2003, concluding that the companies that use Intensive ICTs adapt better to meet the demands of the tourism market, being able to differentiate

the service to consumers, which improves their productivity and the economic returns of the invested capital ; Sigala, (2007) indicates that ICTs can be considered very important factors both in the demand and in the supply of the tourist activity market through the creation of cyber intermediaries that articulate the different web 2.0 tools in a e-commerce model. Litvin et al. (2008) study the effects of digitalization of interpersonal influence and Word-of-Mouth or eWoM , that is, word of mouth promotion, the descriptive study establishes that the eWoM method stands out in hotel and tourist activity, these Services being difficult to have an anticipated idea of the service that is being consumed, make the use of technologies such as the Internet very useful when having a review and evaluating it if it meets expectations; On the other hand, Bambauer-sachse & Mangold (2011) when examining the negative effects of the eWoM , highlight the importance of the online dissemination of negative reviews of a product or service, in the case of being negative, it would detrimentally affect the (tourist) brand in the value of the good or service, even if it is a brand with a great position in the market.

Lopez et al. (2009) with the objective of analyzing the impact of electronic commerce through a survey of 457 university students, which shows that the acquisition of tourist products through the Internet is a socially accepted habit, since they consider it as an opportunity to increase their options to accumulate experiences more quickly and efficiently. González (2011) compiles the benefits of the use of the Internet in the commercial management of tourist products, in which he details in a descriptive and conceptual way the phases of use of technology in tourism promotion, dividing in to three generations stages, the first, which is characterized by being the use of the web the main resource and the online commercial management of tourist products began , the second generation, is characterized by the rise in the use of web pages, emails, promoting commercial management in the tourism companies, and finally the third phase that incorporates the use of social networks and other virtual communities on the web.

Shengnan et al. (2012) analyze from the perspective of sociability, mobility and intentionality the relationship between the use of social networks in the tourism promotion of a region, the authors conclude that the effect of the use of social networks is significant and identify four phases. of the destination marketing communication process that consists of building a true relationship with potential tourists, establishing a travel agreement, enjoying the trip and collecting feedback after the trip, due to the significant number of people who use the internet the reach of influence and coverage of comments is much greater than in traditional media.

Sotiriadis & Zyl (2013) explore the impact that the use of the social network Twitter has on the choice of tourist services by potential visitors due to the expansion of social networks and their high degree of information coverage, they conclude that the use of the social network Twitter helps the dissemination of information, the social network provides reliability of the reviews, interactive participation between visitors and potential visitors and finally offers the experience of the users of the social network that serves as a positive or negative review of the place to visit; Hudson & Thal (2013) describe a new process in which the use of social networks for the decisions of consumers of tourism products is highlighted, the authors mention that those companies that use social networks as a means of disseminating their products have greater probability of being chosen and likewise have a better return on the investment made, although it generally only represents 1% of your financial budget. Perdomo et al. (2014) through a bibliographical and documentary research intend to study and determine the challenges of the tourism sector to use new technologies to enter new markets, conclude that the use of ICTs allow establishing commercial ties with clients in a participatory manner, Informed, co -creative content that is geared to meet your needs.

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Cerezo & Guevara (2015) study the levels of adoption of ICTs in tourism companies in the Autonomous Community of Andalusia, in which they indicate that the implementation and use of new technologies increase considerably, however, there is still a need to improve, they also mention that its use has contributed to modifying the structure of the tourist distribution system, transforming the production, distribution and commercialization systems of companies and destinations, in addition to having an impact on the habits of tourists. Ferrá & Cardona (2015) indicate that social networks in tourism companies, specifically in the hotel sector, considering the six largest hotel chains in Spain, their presence on Facebook, Twitter, and YouTube are analyzed, and they conclude that the positioning of Brands on social networks is a resource that can be capitalized on, to make a difference from your competitors. Christou (2015) mentions that social networks help to establish a link between visitors and travel operators, through a survey carried out in the Greek cities of Thessaloniki and Athens, the results indicate that a sense of trust and loyalty arises between the operators. of travel and visitors, linking travel service marketing and social media reinforce each other.

Causado et al. (2015) with the objective of analyzing information and communication technologies in the hotel sector of the city of Santa Martha - Colombia, surveying 314 accommodation establishments, the results indicate that 75% of the establishments are updated in technological matters, which reflects higher levels of management and organization in hotel companies, in short, this economic sector has moderately adopted technological advances, which shows the existence of various challenges in this matter. Segovia et al. (2015) compared the impacts generated from the effective use of ICTs in the companies of the Department of Tolima in the period of three years, mainly in hotels and restaurants, they conclude that the implementation of technologies had a favorable effect on the performance of the companies of the tourism industry, investment in infrastructure such as Wi -Fi zones and in the virtual field with web pages being essential; allowing companies to boost advantages over the competition which is reflected in business growth

Baca et al. (2017) examine from a sample of 300 micro, small and medium-sized companies in the Mexican towns of Victoria, Jaumave -Tula and Tamaulipas the digital gap in the tourism, commercial and services sector, the results indicate that, in this case, the Business processes are driven by the capacity of human capital in the use of ICTs . Puiggros et al. (2017) explore the effects of ICT implementation in museums in the city of Barcelona between 2012 and 2013, evaluating *online activity* by considering aspects such as website usability, positioning, social networks and applications. for mobiles, in addition to field work observing the behavior of museum visitors, first of all, the researchers detected inefficiencies in the management of websites, since they do not offer an adequate experience for the visitor since they are not configured with an automatic translator of the content, at the same time they lack interactive information and complementary resources such as videos, audios, among others. On the other hand, the digital infrastructure of museums is not attractive to visitors, reflecting a low exploitation of all the potential that new technologies can offer to users.

Rodríguez & Rodríguez (2018) study in an exploratory and descriptive way with the help of business marketing models in micro, small and medium-sized tourism companies in Colombia, in a sample of 97 companies, they conclude that tourism is an emerging strategic economic sector in the country of study, however, ICTs such as the use of the Internet have improved sales between 78% and 79%, on the other hand, in the case of social networks and virtual travel agencies they have contributed between 60% and 65% in economic performance; Pinilla & Alarcon (2018) carry out a descriptive analysis of the impact of ICTs in the hotel sector of the

Colombian town La Candelaria, specifically in 20 hotels, 31 hostels and 1 tourist residence, the authors mention that the use of new technologies It has had an important influence on the development of the operational activities of companies, its investment has resulted in increased competitiveness in the market and making them more visible to demand.

Likewise, Tafur et al. (2018) compiles the various tourism digitization projects in the city of Guayaquil-Ecuador, in which they identify two with the greatest recognition, "Guayaquil is my destination" and "Goraymi.com" which have worked to sustainably maintain the tourism promotion of the city, increasing its followers on social networks each year, the authors mention that while the use of new technologies increases, both the service, the costs and the quality of the service will be better; Quinones et al. (2019) explore the impact of technology on community tourism through the application of surveys, concluding that the accessibility of information is essential for tourist activity, saving both the company and the user resources in temporal and monetary terms, providing greater scope to tourism promotion by expanding its area of influence, likewise, the authors indicate that technology mitigates the environmental, visual and auditory pollution generated by traditional advertising channels, finally providing greater options such as strategies and the organizational capacity of organizations community tourism.

Quesada de la Rosa (2019) emphasizes the role of the augmented reality and virtual reality technique and its relationship with cultural dissemination, the bibliographic analysis shows that these techniques optimize the experience and delight of tourists, as well as learning and increasing interest in cultural content, on the other hand, also helps to increase the intention of visiting more frequently; Ballina (2019) study the relevance of Smart Tourism Destination as a determinant of the experience in tourists in the rural sectors of the municipalities of Taramundi and Girón- Spain through a statistical analysis of interviews conducted with tourists, who, being an active part of the design of their own experience, ensure a high level of satisfaction , STD processes are decisive in the economic development of tourism in the rural sector.

Adeola & Evans (2020) examines the correlation between ICTs, infrastructure and tourism development in Africa in the period 1996 to 2016, through a dynamic panel gravity model, the results indicate that ICTs and infrastructure have a direct and decisive relationship with tourism development, the authors mention that macroeconomic variables such as the real exchange rate and foreign wealth are important positive factors, factors such as distance negatively influence tourism, that is, distant countries and difficult access generate higher costs for visitors; in the same way

Pionce et al. (2021) documentally analyzes the economic impact that ICTs have on the tourist activity of the La Pila-Ecuador community, through the elaboration of virtual material it was possible to implement a registry of the heritage assets that the community has. At the Latin American level, Sevilla (2021) evaluates the use of electronic commerce in tourism, the bibliographic analysis indicates that electronic commerce offers fluidity in commercial relations, the benefits of electronic commerce for Latin American tourism with the use of Social networks are important, because it increases the speed of transactions, improves communication with customers, eliminates borders and represents the possibility for brands to have an instant and easy presence in different markets.

Likewise, it is highlighted the research by Tyan et al. (2021) that analyzes the implementation if smart touristic destinies through the use of Blockchain technology, with the end of improving the touristic experience, rewarding sustainable behavior, guarantee benefits for local communities, and reducing the worry regarding privacy, combined with other existing

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technologies such as internet or AI; even pushing medical tourism, Tyan et al. (2021) argue that they could facilitate access to medical consults and ease payment methods, while allowing tourists to keep their private information safe; finally, Garcia et al. (2023) studies the touristic trade in the coast of Spain, due to the external negative context of tourism due to environmental issues, the authors propose turning touristic areas, such as beaches, into smart spaces, through the implementation of devices that aid in internet coverage and geographical location and navigation.

Methodological Strategy

Methodology

For the development of this objective, the estimation of a basic regression model with panel data will be carried out; and in this way verify the relationship between the use of ICT and the growth of the touristic sector in Ecuador, during the analysis period.

The research is based mainly on what was stated by (Katz, 1988), who argues that the way to achieve progress in societies is through the information economy, especially with the adoption of ICTs in the economy to strengthen the economic growth. Therefore, the econometric model to be estimated is detailed in Equation 1.

$$CST_{it} = (\alpha_0 + \beta_0) + \gamma_1 TIC_{it} + e_{it}(1)$$

Where CST_{it} is the dependent variable that represents the growth of the tourism sector in province i (i = 1, 2, 3, ...21) in period t (t = 2008, 2009, 2010, ...2021); TIC_{it} is the independent variable that measures the impact of ICTs on the growth of the Ecuadorian tourism sector; y e_{it} is the stochastic error term. Finally, ($\propto_0 + \beta_0$) they measure the effect in time and space, respectively.

(Hausman, 1978) test was used as a contrast of robustness versus efficiency in the estimators, considering the following decision criteria taking into account equation 2.

$$Y_{i,t} = \beta_{1i} + \sum_{k=2}^{K} \beta_k X_{ki,t} + \mu_{i,t}$$
 (2)

H0: Xki,t and αi are not correlated, the random effects model, GLS is consistent and efficient; and the LSDV model is consistent and inefficient.

H1: Xki,t and α i if they are correlated, the random effects model, GLS is not consistent; and the LSDV model is consistent and inefficient.

To determine the existence of autocorrelation, it was evaluated using the (Wooldrige, 2002) Test, which considers the estimation of regression residuals, calculating first differences, which responds to the models presented in equation 3 and 4.

$$y_{i,t} - y_{i,t-1} = (X_{i,t} - X_{i,t-1})\beta_1 + \epsilon_{i,t} - \epsilon_{i,t-1}$$
(3)

$$\Delta y_{i,t} = \Delta X_{i,t} \beta_1 + \Delta \epsilon_{i,t} \tag{4}$$

where Δis the first difference operator .

To determine the condition of heterocedasty, it was evaluated using the Breusch & Pagan (1979) test for random effects estimators, shown in equation 5.

$$LM = \frac{IT}{2(T-1)} x \left[\frac{\sum_{i=1}^{I} \left(\sum_{t=1}^{T} u_{it} \right)^{2}}{\sum_{i=1}^{I} \sum_{t=1}^{T} u_{it}^{2}} - 1 \right]$$
(5)

where T is the number of periods and I is the number of cross-dependency units

The test uses the following null and alternative hypotheses:

Null hypothesis (H0): Homoskedasticity is present (residuals are distributed with equal variance)

Alternative hypothesis (HUn): Heteroscedasticity is present (residuals are not distributed with equal variance)

If the p-value of the test is less than some significance level (ie, $\alpha = .05$), then we reject the null hypothesis and conclude that heteroscedasticity is present in the regression model.

To correct the estimation bias caused by non-compliance with the basic postulates of the econometric analysis of homoscedasticity and non- serial autocorrelation , a Generalized Least Squares (GLS) model is used. The element ($\gamma 0 + \delta 0$) represents the instability at a temporal and spatial level, finally, the parameter $\mu_{i,t}$ is the stochastic error term.

Data

The data in the present investigation will be obtained according to the approach of the objectives, for the analysis of the relationship between the economic development of tourism and the use of information and communication techniques, the statistical sources that will be used will be from the Ecuadorian Institute of Statistics and Censuses "INEC" (2022) and the Central Bank of Ecuador "BCE" (2022); The Gross Value Added (VAB) of accommodation and food services will be used as the dependent variable, which measures the growth of the tourism sector, and the use of cell phones, internet and computers as the independent variable, which measures the use of ICTs, in the Table 1 describes the variables used within the proposed model.

variable and notation	Notation	Unit of measurement	Data source	Description
Growth of the tourism sector	CST	Dollars	ECB	The growth of the tourism sector represents the GVA of lodging and food activities. The variable is expressed in thousands of dollars.
Use of ICT	TIC	Index	INEC	ICTs represent the use of cell phones, internet and computers converted into an index based on the average of each of the three categories. The variable is expressed in index.

Table 1 Description of Variables and Data Sources

It is important to emphasize that the analysis is carried out for 21 provinces, excluding the province of Galapagos and articulating the province of Santo Domingo with Pichincha and Santa Elena with Guayas due to their representation in the national product and to achieve greater precision in the results. , in the period from 2008 to 2021, 294 observations are analyzed, Table 2 describes the statistics of the variables, in the case of the growth of the Tourism Sector at the **Journal of Posthumanism**

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national level there is an average growth of 10.24% during the period 2008-2014, with respect to the average, the data is little dispersed both between provinces and in comparison with other years; In the case of the use of ICTs, there is an average use of 43.20%, in this case the data show a greater dispersion within each province, that is, that the percentages of use of ICTs is very Variable over time and between provinces, the conditions of access to the Internet, social networks and a computer are unequal.

Variable		Half	Dev. Est.	Min	Max	Observations
Tourism Sector Growth	In general	10.24	1.38	7.64	13.62	No. = 294
	Between		1.38	8.13	13.31	n=21
	Inside		0.29	9.45	10.93	T = 14
Use of ICTs	In general	43.20	10.42	20.01	67.87	No. = 294
	Between		4.18	36.86	52.65	n=21
	Inside		9.59	21.24	62.60	T = 14

Table 2 Descriptive Statistics of the Variables

Data on the added value of the accommodation and food services activity reported by the Central Bank of Ecuador indicate that the tourism sector maintained sustainable growth, Lemoine et al. (2020) highlights a significant variation of tourists to Ecuador, the accelerated growth of tourist activity in 2017 is attributed to various factors, including the efforts of the national government to encourage this economic sector, likewise, the consumption habits of tourists. They have also favored this boom, since the tourist offer has committed to offering more familiar and leisure environments that increase visitor satisfaction; On the other hand, Morales & Maza Mónica (2019) indicate that in 2017 Ecuador has received a large influx of foreign tourists, this is because Ecuador has a variety of natural attractions that have been a trend abroad; finally, Urvina et al. (2022) conclude that the incursion of the companies that offer the accommodation service and the food service in advertising through social networks, has favored the economic results of this activity.



Figure 1. Evolution of the added value of the Accommodation and Food Services activity.

Note. Elaboration with data from the Central Bank of Ecuador.

According to the data provided by the Ecuadorian Institute of Statistics and Censuses, as of 2008, the percentage of households that have used the computer, the Internet or social networks has been increasing until 2016, however, as of that year shows a decrease in the percentage of the use of technological means, Botello (2015) mentions that the level of income is decisive for access to technologies, likewise the population agglomeration facilitates the provision of digital services, the main beneficiaries being the inhabitants of urban areas, that is, in the most developed cities, while in rural areas, since households are dispersed at a greater distance, it is more expensive to provide the services; there is a considerable increase in the use of information technologies due to the confinement measures due to the COVID-19 health emergency, especially in the workplace and in education, however, as the confinement measures have become more flexible, the modality has also returned present in daily activities.



Figure 2. Evolution of the Percentage of Use of Icts

Note. Elaboration with data from the Ecuadorian Institute of Statistics and Censuses.

For the correlational analysis of the variables, the provinces of Pichincha and Guayas have been separated from the rest of the provinces, because they present structural conditions that are different from the rest of the Ecuadorian provinces, such as the level of income and population. Figure 3 shows the representation of the correlation between the variables under study in the period 2008-2021, without considering the provinces of Pichincha and Guayas; The graph shows that the variables have a weak degree of linear correlation «r=17.11», however, it is statistically significant, the economic growth of tourism has a direct relationship with the use of technology, that is, the increase in The use of social networks, computers and the Internet in Ecuadorian homes economically benefits accommodation and food service establishments.



Figure 3.

Dispersion of the use of ICTs in relation to the Growth of the Tourism Sector (except Pichincha and Guayas)

Figure 4 shows the representation of the correlation between the variables under study in the period 2008-2021 in the provinces of Pichincha and Guayas; The graph shows that the variables have a moderate degree of quadratic correlation « r=45.60», it is statistically significant, the economic growth of tourism has a direct relationship with the use of technology, that is, the increase in the use of networks social, computer and internet in Ecuadorian homes economically benefits lodging and food service establishments, however, the data also reveals that the use of information and communication technologies have limits in their economic benefits, since at one point determined tend to show diminishing returns, to later be detrimental to economic activity, mainly due to infrastructure and coverage limitations that can be found in these provinces.



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Figure 4.

Dispersion of the use of ICTs in relation to the Growth of the Tourism Sector (Pichincha and Guayas provinces)

Results and Discussion

With the objective of determining the existence of a relationship between the level of use of information and communication technologies with the economic growth of the tourism sector in Ecuador, the conditions of the data collected in the statistical sources are evaluated, table 4 shows that The coefficients of the proposed model show a *Prob* >*chi2* =0.6787, that is, that the estimators have non-systematic or non-standardized differences and indicates that the random effects estimator is more efficient in this case.

Coefficients					
	(b)	(B)	(bB)	<pre>sqrt(diag(V_bV_B))</pre>	
	fixed	random	difference	HE	
TIC	0.0191598	0.019183	-0.0000232	0.0000561	
b = consistent under Ho and Ha; obtained from xtreg					
B = inconsistent under Ha, efficient under Ho; obtained from xtreg					
Test: Ho: difference in coefficients not systematic					
$chi2(1) = (bB)'[(V_b-V_B)^{(-1)}](bB)$					
=	0.17				
Prob>chi2 =	0.6787				

Table 4 Hausman Test

Wooldridge serial autocorrelation test in Table 5 indicates that the proposed model presents a Prob > F = 0.0000; the null hypothesis of the absence of first-order serial autocorrelation is rejected, that is, there is a significant influence of the error terms on the subsequent error terms during the study period.

Wooldridge test for autocorrelation in panel data			
H0: no first order autocorrelation			
F(1, 20) =	222.97		
Prob > F =	0.0000		

Table 5 Wooldridge Serial Autocorrelation Test

The Breusch-Pagan heteroskedasticity test for estimates of variable effects, in Table 6 shows a *Prob value* >*chi*2=0.0000, which means that the model shows heteroscedasticity characteristics , that is, that the residuals are spread out from the mean, it is interpreted as that the endogenous conditions of the panels in which the estimation is made, in this case, of the Ecuadorian provinces, differ from one another, which makes the estimated model statistically unreliable.

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Breusch and Pagan Lagrangian multiplier test for random effects				
lvabt[ID,t] = Xb + u[ID] + e[ID,t]				
Estimated results:				
	Var	sd= sqrt(Var)		
lvabt	1.8952	1.3767		
and	0.0561	0.2368		
or	1.8736	1.3688		
Test:				
Var(u) =	0.0000			
chibar2(01) =	1777.0900			
Prob > chibar2 =	0.0000			

Table 6 Heteroscedasticity Test Breusch and Pagan

The estimation of ordinary least squares, in Table 6, according to its value $Prob > chi2 \ 0.0012$ inca, which is a balanced model, at a global level is statistically significant, which means that the economic growth in establishments dedicated to providing health services accommodation and food, are explained by the boom in the use of computers, internet and social networks by Ecuadorian households; The use of ICTs has positive and significant effects on the generation of added value in the tourism sector, however, having a significant relationship, the net contribution of technologies is still reduced, for each one percentage point that increases the use of ICTs the accommodation and food services sector will have an economic growth of 0.01%.

	GLOBAL
TIC	0.00765 **
	(3.23)
Constantly	9,652 ***
	(73.03)
Observations	294
n_g	twenty-one
wald chi2	10.44
Prob > chi2	0.0012
g_min _	14
g_avg _	14
g_max _	14

Table 6 Estimation of The Generalized Least Squares Model

t statistics in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

The returns on technological investment and operational and managerial digitization in economic activities in the Latin American territory are still relatively low, consistent with what was stated by (Rodríguez & Rodríguez, 2018), calling it an emerging strategy requires a comprehensive analysis of the infrastructure, economic capacity and consumer behavior for its **Journal of Posthumanism**

success. It can be seen that both a socioeconomic and a cultural change can promote the digitization of the tourism sector (Vilaseca et al., 2006); on the contrary, (Bambauer-sachse & Mangold, 2011) emphasize the damages of how easy and fast the transmission of information is through technology, and more when it comes to negative reviews of the tourist offer.

For accommodation and food service establishments in Ecuador, the use of technology is positive, as is the case in communities such as Catalonia (Vilaseca et al., 2006), Andalusia (Medina & Guevara, 2015), Santa Martha (Causado et al., 2015), Tolima (Segovia et al., 2015), in order to increase advertising coverage in which they can publicize their services to more potential visitors and, on the other hand, create better management processes. productive and organizational with lower costs, that satisfy the needs of tourists and establish a sense of loyalty towards the brand (Christou, 2015).

However, with excessive use, the effects of the use of technology change, the correlational analysis of the Pichincha and Guayas provinces, a greater use of ICTs deteriorate the economic performance of accommodation and food establishments, due to the Instruments such as virtual reality and augmented reality remotely provide an experience similar to that obtained when traveling to a local tourist spot, without the need to incur travel expenses such as lodging and food; On the other hand, the information obtained from tourist places in other provinces causes the displacement of tourists outside these provinces.

Conclusions

Concluding the investigation of the effects that the use of ICTs have on the economic growth of tourist establishments, the analyzes conclude that although technology is a strategic ally for businessmen and entrepreneurs, in Ecuador there is still a long way to go both level of infrastructure implementation necessary for establishments to take advantage of the operational and organizational facilities of ICTs, as well as in the development of human capital focused on the use of technology.

In the provinces of Ecuador (except Pichincha and Guayas) it is necessary to fully exploit the benefits of the use of ICTs since studies show that there is a positive relationship between the two variables; For the provinces of Pichincha and Guayas, challenges arise since the greater use of technology tends to economically harm tourist establishments in these locations, either due to the convenience provided by technology or the opportunity to travel to another province.

Regarding the infrastructure, it is up to the relevant public entities to provide and facilitate both the installation and maintenance of facilities that serve to provide internet coverage; On the other hand, the tourism organizations and local governments must intervene with training programs on business digitization and tourism so that businessmen-entrepreneurs make the most of technological resources.

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