Empirical Article

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Internet penetration and international travel and tourism expenditure: The role of foreign exchange control

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Abstract

The total amount of digital travel sales worldwide increases significantly every year, yet previous studies on outbound tourism expenditures have scarcely discussed the role of foreign exchange control (Fxc) as a barrier to e-internationalization. In the era of e-commerce, residents of more than 40 economies are not allowed to buy or pay for foreign products by the Internet. This article, with data from 95 economies in the period 2012–2017, concludes that Internet penetration development increases international tourism expenditure. On the other hand, the control of foreign exchange decreases the relationship between internet penetration and tourism expenditure. Therefore, Fxc is clearly a barrier to electronic internationalization and tourism expenditure.

Keywords

E-commerce, E-internationalization barrier, foreign exchange control, internet penetration, tourism expenditure

Introduction

In recent decades, the tourism sector has become a key factor in the economic development of a large number of countries. The importance of tourism in relation to gross domestic product (GDP) has grown significantly and is for many countries a strategic sector of their economy. The

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expansion of tourism, especially international tourism, and the development of telecommunications and transports have led to a series of profound transformations in the sector, which has made international tourism a fundamental factor in guaranteeing growth and expansion of the tourist sector. The study of international tourism spending is essential for authorities since it favors the development of the sector and the growth of the economy in their respective countries.

Tourism is one of the sectors that have benefited most from the development of the Internet and Information and Communication Technologies (ICTs). This sector has been able to quickly adapt its business to the characteristics required by this communication platform and is one of the most important sectors in terms of e-business volume. The tourism sector has been a pioneer in adopting and developing ICT applications and today is rated among the top product or service categories purchased via the Internet (Garín-Muñoz and Pérez-Amaral, 2011; Marcussen, 2008). Both companies in the sector and clients have found the Internet a fundamental tool for managing their interests. New e-business forms offer significant opportunities for all tourism destinations and suppliers, whether small or large, to improve their business and remodel it in a more profitable way (WTO, 2001a). The Internet allows a fast, efficient, and low-cost relationship between companies in the tourism sector and their potential clients (Anckar and Walden, 2001; Buhalis, 1998). The development of the Internet in all countries has been a great opportunity for the expansion and growth of the tourism sector.

Twenty-first century tourists have access to all the information they need in increasingly sophisticated sources thanks to the Internet and social media (WTO, 2001b; Xiang and Gretzel, 2010). New markets and partnerships can be accessed, resulting in new opportunities and business models that add satisfaction and customer value. Profitability has increased, as well as segmentation, targeting, and positioning strategies are more effective (Akehurst, 2009). Thus, online tourism market is presented as one of the most successful e-commerce implementations.

Digitalization is changing the way customers buy and consume and the way companies market, offer, charge, and deliver their products and services. We work now in a global and digital world where different variables should be analyzed under a multidisciplinary perspective. Thanks to the use of the Internet, today, more than ever before, it is much easier to buy and sell products and services to customers from all over the world (Xiang and Jing, 2014) as well as to transfer money and data to execute transactions internationally. Particularly, mobile devices make it possible for consumers to make purchases from anywhere at any time (Pantano and Priporas, 2016). Hence, we have a real e-internationalization. However, different challenges and problems need to be analyzed. Companies face among other aspects, different languages, currencies, brand representation online, as well as seasonal trends.

E-commerce market grows rapidly with the growth of the Internet (Wang et al., 2008), and e-payment is quickly becoming a consumer habit. In fact, mobile payments are increasing exponentially (Statista, 2018b; TrendForce, 2016). Restrictions on payment methods and foreign exchange controls (Fxc) can substantially impact the strategic choices of the digital trade's private sector players (Kathuria et al., 2019).

In the tourism sector (as in other services), e-internationalization is even easier because it is not necessary to develop a logistics system or overcome tariff barriers. Digital technologies have brought significant transformation to the tourism industry. Digitalization has transformed the traditional roles of tourism producers and consumers, with new roles, relationships, business models, and competencies emerging (Dredge et al., 2019).

Social media are an increasingly significant role as information sources for travelers. Internet technology provides high-quality and efficient operations in all economic sectors, and tourism is

one of the sectors where a greater amount of free information is available online. It is evident that e-commerce is an essential requirement for success, especially for the tourism industry (Law et al., 2009).

Although historically most movements were carried out from north to north, this is changing and it is projected that departures from other regions, such as Africa, the Middle East, and Asia-Pacific, will grow exponentially in the near future (World Economic Forum, 2017). In fact, in the last decade, tourist spending by developing countries has grown faster than that of advanced economies. Therefore, in any research in this area, we should place importance on the particular environment and socioeconomical situation of developing countries since it is an increasingly important potential market. This situation forces us to review some of the tourism indicators analyzed in the previous literature, as well as study the effect of other restrictions not contemplated so far, and especially those present in developing and more protectionist countries.

According to the International Monetary Fund's (IMF's) Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER), in 2017, more than 40 economies were subject to some degree of exchange restrictions and/or multiple currency practices (MCPs). In the era of e-commerce, residents of more than 40 economies may have some restrictions to buy or pay for foreign products over the Internet. Total digital travel sales worldwide increase significantly every year (Eurostat, 2016; Marketer, 2017; Statista, 2018a), but previous studies have barely discussed the role of Fxc.

An increasing number of countries have invested in tourism development, making tourism sector an important driver of socioeconomic progress through the creation of enterprises, jobs, and infrastructure. The use of technologies in the search for information about destinations is decisive and any inhibitor should be analyzed.

This article offers an empirical analysis, in the period 2012–2017, with a sample of 95 economies, to evaluate the effects of internet penetration—the number of individuals using the Internet and percentage of population—in expenditure of outbound visitors. A moderating variable has been included a political and governmental inhibitor not widely studied before: Fxc. The key question that underlies the discussion is whether Fxc measures are clearly a barrier to tourism e-internationalization and hinder the development of internet penetration to create and sustain more tourism expenditures.

The article is structured as follows. The second section briefly reviews the relevant literature. The hypotheses are posed in the third section. The empirical design is described in the fourth section, followed by the Results in the fifth section. The sixth section offers the main conclusions.

Literature review

Most models of international tourism demand include variables such as income per capita; relative prices, transportation costs, and the volume of tourism investment (Choyakh, 2008; Lim, 1997). Other studies incorporate the effect of exchange rates (Belloumi, 2010; Webber, 2001), domestic inflation (Dwyer et al., 2002), population aging (Glover and Prideaux, 2009), air transport, registered carrier departures worldwide (Cho, 2010), visa restrictions (Cheng, 2012), accommodation capacity (Aslan et al., 2008; Proença and Soukiazis, 2005), tourism budget including advertising expenditure (Witt and Martin, 1987), climate variables (Li et al., 2017; Steiger et al., 2020; Wu, 2020), local and global financial crises (Mat Som et al., 2014), terrorism (Seabra et al., 2020), and even epidemics (Teitler-Regev et al., 2014). Fortunately, thanks to the use of the Internet, most of

these factors are reflected quickly in the social media (Asur and Huberman, 2010; Chunara et al., 2012; Vecchio et al., 2018).

While most tourism studies have focused on international incomes—or inbound expenditures—and the modeling of international tourism demand, fewer consider international tourism expenditures (ITEs)—or outbound expenditures. From an economic point of view, we should not underestimate the importance of knowing the factors that could affect ITEs. Countries that are able to attract high inbound tourism receipts per capita also have high outbound tourism expenditures per capita (Vietze, 2011). Moreover, according to Simonetti et al. (2019), GDP has both a short-term and long-term relation with ITEs.

From the point of view of outbound tourism expenditures, Sokhanvar et al. (2018) analyze the effect of prosperity sub-indices, such as safety and security, education, and health. Some results contrast with Vietze (2011). Vietze's (2011) estimation reveals a strict robust positive impact of all economic factors, such as per capita incomes and openness to trade. On the other hand, most of the sociological factors show a rather weak significance. Some local factors were the level of attractive domestic tourism, inbound tourism receipts per capita, information infrastructure and good governance (Vietze, 2011), as well as savings regime (Wang, 2014). Some control variables included were country's size, demographic density, the number of land borders, and climate in the country of origin (Vietze, 2011).

The role of e-commerce in the tourism industry should not be underestimated: It is a crucial driving force in the current information society (Shanker, 2008). Previous works on e-commerce introduce the issues of technology acceptance models (Venkatesh et al., 2003), risk (Dredge et al., 2019; Kim and Srivastava, 2007), trust (Fang and Li, 2020; Shao et al., 2019), gender (Shao et al., 2019), as well as shopper satisfaction (Marinao-Artigas and Barajas-Portas, 2020), among others. The literature also reveals several possible e-commerce inhibitors. Together with organizations' internal barriers, we can find external barriers, depending on the country—the infrastructure (technological and economic) as well as political, legal, social, and cultural barriers (Kapurubandara and Lawson, 2006).

Even though most of the barriers are directly related in cause–effect relationships and well described by the literature, a crucial factor not considered before is Fxc. Hence, this article analyzes, with different models, if Fxc is really an inhibitor for the tourism sector e-internationalization by including it as a moderating variable of the effect of the level of individuals using the Internet (% of population) on per capita international travel and tourism (T&T) expenditures.

Econometric specification and hypotheses

Thanks to e-commerce development, consumers can now purchase seemingly countless items online and expect to organize on their own any trip they wish. But not only has the profile of the client and the provider changed, the environment and the variables that must be analyzed are also different. E-payment is an efficient transaction and should be integrated into any business strategy.

Currency controls, Fxc, or currency exchange controls are a set of restrictions applied by some governments to ban or limit the sale or purchase of foreign currencies by nationals or residents and the sale or purchase of local currency by foreigners or nonresidents or the transfers of any currency across national borders.

Common Fxc include banning the use of foreign currency within the country, banning locals from possessing foreign currency, restricting currency exchange to government-approved

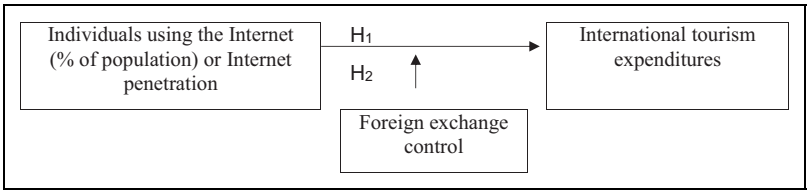

Figure 1. Research model.

exchangers, fixed exchange rates, as well as restrictions on the amount of currency that may be imported or exported.

By using Fxc, for example, governments can keep their exchange rates artificially high to protect their export level and domestic production. In addition, governments can devalue their currency artificially. By doing so, domestic products will be cheaper on the foreign market so generating more income in terms of local currency and increasing the export level. Moreover, the price of foreign goods will be more expensive on the local market, which will result in fewer imports.

Such controls used to be common, particularly in poorer countries, until free trade and globalization started a trend towards economic liberalization in the 1990s. Today, countries that still impose exchange controls are the exception rather than the rule. Even so, according to the IMF's AREAER, in 2017, more than 40 economies are subject to some degree of exchange restrictions and/or MCPs.

In the era of e-commerce, residents of more than 40 economies do not have full freedom to buy or pay for foreign products over the Internet, especially if they are subject to restrictions on the amount of currency that may be imported or exported. So, we could hypothesize that Fxc may affect per capita ITEs (and receipts).

Fxc is a challenge for international companies as it hinders their ability to trade in local markets. These restrictions often increase and even prevent crossborder payments (Figure 1).

Given all the above, the main hypotheses and conceptual model are as follows:

Hypothesis 1: A higher level of population using the Internet is associated with a significantly higher level of international tourism expenditures.

Hypothesis 2: Foreign exchange control influences the effect of a higher level of population using the Internet on the level of international tourism expenditures.

Empirical design

Data and variables

Empirical analysis was applied for 6 years from 2012 through 2017. To facilitate its annual application to study the trend of future research, the data are annual values, instead of averages over a period of several years, which may eliminate the effects of random factors, such as certain errors in measurement.

Data are collected on a regular basis through independent sources, so minimizing the burden on future researchers on the same topics and making the evolution map of the different variables. Following Simonetti et al. (2019) and Vietze (2011), major data source is World Bank data.

Besides, we used two other internationally recognized and established data sets: the IMF's AREAER and the World Economic Forum, Executive Opinion Survey.

To have a consistent panel data analysis, we needed data on similar constructs across all the years, and this was the key factor that determined the time period we examined. Furthermore, as the variables used in this study were taken from different sources, it was essential to consider only those countries for which data were available in all the reports and years. Consequently, we were left with data from 95 countries, which provide a total of 285 observations. The panel is, therefore, unbalanced.

Dependent variable. The dependent variable is ITE (current US$) per capita. *ITE* are expenditures of international outbound visitors in other countries, including payments to foreign carriers for international transport in relation to the total population between the ages 15 to 64. ITEs may include those by residents traveling abroad as same-day visitors, except in cases where these are important enough to justify separate classification. For some countries, they do not include expenditures for passenger transport items. Data were calculated based on World Bank data—logarithm of ITEs divided by total population between the age of 15 and 64.

Independent variable. Following Vietze (2011), our central explanatory variable is individuals using the Internet (% of population) or nternet penetration (*Eusing*). It is the relationship between the number of internet users in each country and its demographic data. Internet users here are individuals who have used the Internet (from any location) in the last 3 months. The Internet can be accessed via a computer, mobile phone, personal digital assistant, games machine, digital TV, etc. Data are from the World Bank, International Telecommunication Union, and World Telecommunication/ICT Development Report and database.

Fxc is the moderator variable, a qualitative binary variable whose values can be "yes" or "no," transformed into a dummy variable "1–0" where "1" indicates the presence of exchange restrictions and/or MCPs—under Article VIII, Sections 2, 3, and 4 or under Article XIV, Section 2, of the IMF's Articles of Agreement—and "0" otherwise. *Fxc* provides descriptions of restrictive exchange measures as indicated in the IMF staff reports. Data were collected from the IMF's AREAER.

Moderator comprises the effect of the moderating variable (*Fxc*) on the effect of the independent variable (*Eusing*) on the dependent variable (*ITE*). It is the interaction between the independent variable and moderator variable. We use the moderator variable to test hypothesis 2.

Control variables. Following Simonetti et al. (2019) and Vietze (2011), our question when choosing the control variables is which explanatory variables exist besides the impact of per capita income on ITE. We assess this question for a broad sample of host countries without considering a specific country of destination. So, regardless of the attractiveness of the potential country of destination, socioeconomic factors in the country of origin can play a crucial role in the decision to travel abroad or not.

Control variables are included and classified in accordance with Simonetti et al. (2019), Rehman et al. (2020), Lee and Jan (2019), and Vietze (2011) and taking into account the T&T Competitiveness Report. For over a decade, the World Economic Forum engaged leaders in T&T to carry out an in-depth analysis of the T&T competitiveness. Published biennially, the T&T Competitiveness Report and Index benchmarks the T&T competitiveness of 140 economies and measures the set of factors and policies that enable the sustainable development of the T&T sector.

	Control variables	
Economic factors		
GDP	GDP per capita based on purchasing power parity (current international $) and natural logarithm	World Bank and International Comparison Program database
ITR	ITRs (current US$) per capita, natural logarithm, are expenditures by international inbound visitors, including payments to national carriers for international transport in relation to the total population.	Calculated based on World Bank data—logarithm of ITRs per capita
PriceC	*PriceC* is one of the main pillars included in the T&T Competitiveness Index. Lower costs related to travel in a country increase its attractiveness for many travelers as well as to invest in the T&T sector. Among the aspects of*PriceC* taken into account in this pillar are airfare ticket taxes and airport charges, which can make flight tickets much more expensive; the relative cost of hotel accommodation; the cost of living, proxied by purchasing power parity; and fuel price costs, which directly influence the cost of travel	World Economic Forum, T&T Competitiveness Report, and Executive Opinion Survey
Sociological factors		
PDensity	Midyear population divided by land area in square kilometers	World Bank, Food and Agriculture Organization, and World Bank population estimates
Csize	Country's total area, excluding area under inland water bodies, national claims to continental shelf, and exclusive economic zones	World Bank. Food and Agriculture Organization, electronic files, and website.
Education	Proxy of the level in each country, how well the education system meets the needs of a competitive economy	World Economic Forum, Global Competitiveness Index, and Executive Opinion Survey
CulturalR	*CulturalR* is another pillar included in the T&T Competitiveness Index. This pillar includes the number of UNESCO cultural World Heritage sites, the number of large stadiums that can host significant sport or entertainment events, and a new measure of digital demand for cultural and entertainment—the number of online searches related to a country's cultural resources can allow the level of interest to be inferred. The number of international association meetings taking place in a country is included to capture, at least partially, business travel	World Economic Forum, T&T Competitiveness Report, and Executive Opinion Survey

Note: GDP: gross domestic product; T&T: travel and tourism; *GDP*: GDP per capita or income per capita; *ITR*: international tourism receipts; *PriceC*: price competitiveness; *PDensity*: population density; *Csize*: country's size or land area; *Education*: quality of the education system, 1–7 (best); *CulturalR*: cultural resources and business; UNESCO: the United Nations Educational, Scientific and Cultural Organization.

Finally, we also controlled for industry and year by temporal and industry dummies.

Some of the variables analyzed have a large standard deviation (SD) compared to their mean. Logarithm transformation is one of the most widely used transformations in regression analysis in these cases. Instead of working directly with the data, the statistical analysis was carried out on the logarithms of the data.

Methodology

To provide evidence on the association between the use of the Internet and ITE, hypothesis 1, we estimate the following model:

$$\mathrm{ITE}_{it} = \beta_0 + \beta_1 \mathrm{Eusing}_{it} + \beta_2 \mathrm{Fxc}_{it} + \beta_3 \mathrm{CountryCharact}_{it} + \varepsilon_{it} \quad (1)$$

where ITE_{it} is a measure of ITE, β_1 captures the strength of association of the use of the Internet (Eusing), Fxc is the foreign exchange control, and CountryCharact is a vector of country characteristics. Our coefficient of interest in this regression is β_1. It assesses the impact of using the Internet on tourism expenditure.

Since we have a panel of countries, we can control for time constant unobserved heterogeneity, which may bias the results from cross-section studies if these unobserved factors correlate with the ITE. Thus, we also present a fixed effects (FE) model of ITE_{it}. The panel version of equation 1 is as follows:

$$\mathrm{ITE}_{it} = \beta_0 + \beta_1 \mathrm{Eusing}_{it} + \beta_2 \mathrm{Fxc}_{it} + \beta_3 \mathrm{CountryCharact}_{it} + f_i + y_t + \varepsilon_{it} \quad (2)$$

where f_i and y_t are the unobserved heterogeneity terms, representing country and year, respectively. The random-effects estimator is only valid if f_i and y_t are uncorrelated with the explanatory variable. We test the validity of the random-effects estimator by a Hausman test, and it rejects the random-effect estimator; hence, the FE results are presented.

The role of Fxc. Finally, to provide evidence for the influence of Fxc on the association between the use of the Internet and ITE, hypothesis 2, we augment equations (1) and (2) with an interaction term between the *Eusing* variable and the *Fxc* variable. Our coefficient of interest in these regressions is the coefficient for the interaction variable that shows how Fxc influences how *Eusing* impacts on *ITE*.

Results

Descriptive statistics

We began with a descriptive analysis of all the variables. Table 1 presents the results including the means, SDs, maximum and minimum values for each variable. It is observed that the mean *Eusing* is over 56%, which is a high figure.

Table 2 compares country-year characteristics for countries with low *using internet* and countries with high *using internet*. Countries with high using internet have higher ITE, GDP, ITR, Education, and Cultural resources. These findings suggest that using the Internet is associated with country characteristics and tourism expenditure.

Table 3 presents Pearson's correlation matrix of the continuous variables analyzed and point-biseral correlation to determine the relationship between Fxc and the rest of variables. It is observed that Eusing has a significant positive correlation with ITE ($r = 0.492, p < 0.01$) implying that countries with high using internet have higher ITE. This correlation conforms to hypothesis 1. Verifying

Table 1. Descriptive statistics.

	N	Mean	SD	Min.	Max.
Dependent variable					
ITE	285	5.577	1.514	2.08	9.08
Independent variable					
Eusing	285	55.974	25.117	3	100
Moderator variable					
Fxc	285	0.191	0.394	0	1
Eusing × Fxc	285	8.536	19.497	0	77.33
Country characteristics					
GDP	285	9.615	1.006	7.1	11.73
ITR	285	5.471	1.659	0.96	9.25
PDensity	285	4.422	0.992	2.17	6.43
CSize	285	12.084	1.790	7.62	16.61
Socioeconomic variables					
Education	284	3.755	0.854	2.05	5.93
PriceC	285	4.668	0.628	3.13	6.19
CulturalR	285	2.639	1.482	1.02	6.94

Note: ITE: natural logarithm of international tourism expenditures per capita; Eusing: individuals using the Internet (% of population); Fxc: dummy variable (1 = presence of exchange restrictions and/or MCPs, otherwise = 0); GDP: natural logarithm of gross domestic product per capita; ITR: natural logarithm of International tourism receipts per capita; PDensity: midyear population divided by land area; CSize: country's total area; Education: an index that measures how the educational system meets the needs of a competitive economy (1 worse–7 best); PriceC: an index that measures the price competitiveness in each country; CulturalR: an index the measures the cultural resources and business of each country; MCPs: multiple currency practices; SD: standard deviation.

Table 2. Comparison of countries with low and high using internet.

	Low eusing	High eusing	*p*Value
ITE	4.581	6.578	0.00
Fxc	0.274	0.107	0.00
GDP	8.891	10.342	0.00
ITR	4.445	6.503	0.00
PDensity	16.491	15.648	0.00
CSize	12.498	11.665	0.00
Education	3.446	4.063	0.00
PriceC	4.860	4.477	0.00
CulturalR	2.296	2.976	0.00

Note: ITE: natural logarithm of international tourism expenditures per capita; Eusing: individuals using the Internet (% of population); Fxc: dummy variable (1 = presence of exchange restrictions and/or MCPs, otherwise = 0); GDP: natural logarithm of gross domestic product per capita; ITR: natural logarithm of International tourism receipts per capita; PDensity: midyear population divided by land area; CSize: country's total area; Education: an index that measures how the educational system meets the needs of a competitive economy (1 worse–7 best); PriceC: an index that measures the price competitiveness in each country; CulturalR: an index the measures the cultural resources and business of each country; MCPs: multiple currency practices.*P*-value:*p*-value of the equality test of means between the level of using internet. This table represents key summary statistics for country-years with low eusing and country-years with high eusing.

multicollinearity is not a problem in our models; a robustness test was run. The indicator used to ensure that our results are not biased by the correlation between the explanatory variables (Marquardt, 1970) is the variance inflation factor (VIFs). The results show that the highest VIF value obtained is 4.79, so in all cases the values are within acceptable limits (cutoff value is 10; Gujarati and Porter, 2003).

Table 3. Pearson and point-biserial correlation matrix.

	ITE	Eusing	Fxc†	GDP	ITR	PDensity	Csize	Education	PriceC	CulturalR
ITE	1									
Eusing	0.492**	1								
Fxc†	−0.229**	0.114**	1							
GDP	0.278**	0.389**	−0.437**	1						
ITR	0.279**	0.213**	0.422**	0.262**	1					
PDensity	0.267**	−0.251**	0.063	−0.166*	0.468**	1				
CSize	0.432**	−0.241**	−0.005	−0.189*	0.291**	0.282**	1			
Education	0.350**	0.408**	0.186**	0.425**	0.318**	−0.111	−0.200*	1		
PriceC	−0.222*	−0.399**	−0.411**	−0.378**	−0.265**	0.187*	0.176*	−0.256**	1	
CulturalR	0.377**	0.348**	0.430**	0.428**	0.375**	0.246**	0.403**	0.204*	−0.321**	1

Note: ITE: natural logarithm of international tourism expenditures per capita; Eusing: individuals using the Internet (% of population); Fxc: dummy variable (1 = presence of exchange restrictions and/or MCPs, otherwise = 0); GDP: natural logarithm of gross domestic product per capita; ITR: natural logarithm of International tourism receipts per capita; PDensity: midyear population divided by land area; CSize: country's total area; Education:an index that measures how the educational system meets the needs of a competitive economy (1 worse–7 best); PriceC: an index that measures the price competitiveness in each country; CulturalR: an index the measures the cultural resources and business of each country.

**, * Significantly different from zero at the 0.01 and 0.05 levels, respectively.

† Point-biserial correlation coefficient.

Panel regression results

Both ordinary least squares (OLS) and FE estimate that a higher internet penetration (*Eusing*) is clearly related to higher *ITE*. The effect is greater in Panel B, which analyzes the group of countries with high Eusing—or with *Eusing* over the *Eusing* median value. Fxc moderates the relationship. Other key factors confirmed regardless of the model are *GDP* per capita, *ITR*, as well as *PriceC*.

Table 4 presents estimates of the effect of *Eusing*—individuals using the Internet or internet penetration—on *ITE* by means of multivariate regression models. We report OLS estimates and FE estimates that aim to hold time-invariant country characteristics constant.

The results of panel A determine the positive and significant relation between *Eusing* and ITE, with both OLS and with FE. ITE increases as the number of internet users increases. The development of the Internet and the generalization of its use for commercial purposes has been a great opportunity in the tourism sector, since it allows quick access to a wide range of tourist destinations as individuals can obtain all the necessary information from them and all the guarantees that the client seeks for the safe realization of their reservations and trips. In addition, it has developed great facilities to pay for these services safely and quickly. These advances in the development of the Internet in the tourism sector have increased spending in this sector. Our results coincide with those of the World Tourism Organization (WTO), the World Economic Forum, as well as with Shanker (2008), according to which the Internet and e-commerce in tourism industry are crucial driving forces in the current information society.

Additionally, we define in panel B, a group of countries with *Eusing* over the *Eusing* median value, and in panel C, a group of countries with *Eusing* below the *Eusing* median value. The results coincide when the countries have a higher level of individuals using the Internet. These results are in concordance with hypothesis 1.

The results in part of the control variable coincide with the previous literature, according to which countries that are able to attract high inbound tourism receipts per capita also have high outbound tourism expenditures per capita (Vietze, 2011). Moreover, estimation reveals a robust positive impact of all other economic factors, such as the per capita incomes (Choyakh, 2008; Lim, 1997; Vietze, 2011) and *PriceC* (Choyakh, 2008; Lim, 1997).

On the other hand, sociological factors such as quality of education (*Education*) and cultural resources and business (*CulturalR*) show a strong significance in panel C, which analyzes the group of countries with low Eusing or with *Eusing* below the *Eusing* median value. Population density (*PDensity*) and country size (*CSize*) are not confirmed as control variables in all the models. These results contrast in part with the World Economic Forum as well as with Sokhanvar et al. (2018).

The coefficient of determination (R2) indicated the goodness of fit of the models. The R2 in our models with all the sample (panel A) are 0.783 for the pooled OLS model and 0.765 for the FE model, which indicates that the predictors of the model, using OLS, explain 78% (76% using FE) of the variance of the dependent variable. In other words, 78% (76% FE) of changes in ITE are related to explanatory variables specified in the models. *F*-statistics of all models are significant at the 0.001 level. Therefore, we conclude that the models are fit and robust.

We next examine whether *Eusing* becomes significant when we consider the influence of the presence of exchange restrictions (*Fxc*). This political and governmental inhibitor was not previously included as a moderating variable nor greatly studied before in relation with international tourism income or expenditure. We report the estimation results in Table 5 using OLS and FE. Panel A reports the results when allowing for differential effects for all countries, and panels B and C, when they have, respectively, higher *Eusing* and lower *Eusing*. To save space and focus the

Table 4. Total ITE: regressions results.

Dependent variable: ITE						
	Panel A		Panel B		Panel C	
	OLS	FE	OLS	FE	OLS	FE
Eusing	0.013 (0.004)***	0.004 (0.002)*	0.018 (0.005)***	0.008 (0.004)**	0.008 (0.010)	0.002 (0.003)
Fxc	−0.012 (0.117)	−0.026 (0.627)	−0.153 (0.139)	−0.011 (0.090)	−0.393 (0.254)	−0.132 (0.913)
GDP	0.602 (0.141)***	0.858 (0.111)***	0.451 (0.138)***	0.724 (0.181)***	0.650 (0.269)**	0.696 (0.167)***
ITR	0.167 (0.874)*	0.163 (0.058)***	0.131 (0.887)	0.144 (0.078)*	0.227 (0.173)	0.256 (0.098)***
PDensity	0.141 (0.065)*	0.248 (0.086)***	0.202 (0.838	0.157 (0.118)	0.089 (0.975)	0.223 (0.127)*
CSize	0.044 (0.047)	0.049 (0.075)	0.001 (0.067)	0.003 (0.113)	0.042 (0.691)	0.045 (0.104)
Education	0.255 (0.051)***	0.051 (0.049)	0.182 (0.128)	0.133 (0.089)	0.272 (0.093)***	0.070 (0.053)
PriceC	−0.227 (0.081)***	−0.090 (0.044)**	−0.182 (0.112)	−0.173 (0.084)**	−0.247 (0.111)**	−0.042 (0.050)
CulturalR	0.103 (0.060)*	0.017 (0.021)	0.067 (0.103)	0.064 0.066)	0.172 (0.077)**	0.026 (0.018)
Constant	0.212 (0.969)	0.173 (1.232)	2.796 (1.555)*	0.429 (1.848)	0.826 (1.462)	0.346 (1.887)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	No	Yes	No	Yes
N	285	285	138	138	147	147
R^2	0.783	0.765	0.687	0.660	0.587	0.568
F	220.71***	90.57***	45,29***	109.16***	50.42***	94.30***
Assumptions						
Normality†	$p = 0.200$	$p = 0.189$	$p = 0.173$	$p = 0.200$	$p = 0.200$	$p = 0.200$
Autocorrelation‡	1.971	1.993	1.994	2.027	2.012	1.997
Homoscedasticity+	$p = 0.821$	$p = 0.697$	$p = 0.778$	$p = 0.633$	$p = 0.729$	$p = 0.733$

Note: *ITE*: natural logarithm of international tourism expenditures per capita; *Eusing*: individuals using the Internet (% of population); *Fxc*: dummy variable (1 = presence of exchange restrictions and/or MCPs, otherwise = 0); *GDP*: natural logarithm of gross domestic product per capita; *ITR*: natural logarithm of International tourism receipts per capita; *PDensity*: midyear population divided by land area; *CSize*: country's total area; *Education*: an index that measures how the educational system meets the needs of a competitive economy (1 worse–7 best); *PriceC*: an index that measures the price competitiveness in each country; *CulturalR*: an index the measures the Cultural Resources and Business of each country; MCPs: multiple currency practices; VIF: variance inflation factor; OLS: ordinary least squares; .FE: fixed effects. Values in parentheses indicate standard error. Multicollinearity: in all cases the VIF was <10 and the conditioning indices <30; atypical and influential cases: none of the standardized residuals was ± 1.96.
*, **, *** significant at 0.10, 0.05, and 0.01, respectively.
† Kolmogorov–Smirnov normality test of the residuals.
‡ Durbin–Whatson test.
+ Levene's test between residual and predicted values.

Table 5. Interaction effects between using the Internet and Fxc: regressions results.

Dependent variable: ITE						
	Panel A		Panel B		Panel C	
	OLS	FE	OLS	FE	OLS	FE
Eusing	0.015 (0.004)***	0.004 (0.002)**	0.020 (0.005)***	0.011 (0.004)***	0.010 (0.010)	0.002 (0.003)
Fxc	−0.549 (0.265)**	−0.195 (0.143)	−0.349 (0.275)	−0.298 (0.200)	−3.478 (3.472)	−0.017 (0.810)
Eusing × Fxc	−0.120 (0.005)**	−0.005 (0.003)*	−0.005 (0.006)	−0.008 (0.005)*	−0.057 (0.051)	−0.002 (0.11)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.301 (0.963)	0.040 (1.228)	2.871 (1.546)	0.827 (1.859)	1.105 (1.502)	0.332 (1.901)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	No	Yes	No	Yes
N	285	285	138	138	147	147
R^2	0.787	0.769	0.689	0.666	0.591	0.568
F	204.67***	364.18***	40.83***	112.08***	45.37***	93.67***
Assumptions						
Normality†	$p = 0.200$	$p = 0.200$	$p = 0.198$	$p = 0.200$	$p = 0.187$	$p = 0.369$
Autocorrelation‡	1.974	2.003	1.995	2.002	1.967	1.991
Homoscedasticity+	$p = 0.688$	$p = 0,707$	$p = 0.736$	$p = 0.713$	$p = 0.599$	$p = 0.609$

Note: *ITE*: natural logarithm of international tourism expenditures per capita; *Eusing*: individuals using the Internet (% of population); *Fxc*: dummy variable (1 = presence of exchange restrictions and/or MCPs, otherwise = 0); MCPs: multiple currency practices; VIF: variance inflation factor; OLS: ordinary least squares; FE: fixed effects. Values in parentheses indicate standard error. Multicollinearity: in all cases, the VIF was <10 and the conditioning indices <30. Atypical and influential cases: none of the standardized residuals was ± 1.96.

*, **, ***Significant at 10%, 5%, and 1%, respectively.

† Kolmogorov–Smirnov normality test of the residuals.

‡ Durbin–Watson test.

+ Levene's test between residual and predicted values.

attention on the research question of main interest, in Table 5 the coefficients for the control variables are not shown, but the results are equally significant.

Hypothesis 2 predicted that *Fxc* would moderate the relationship between *Eusing* and tourism expenditure, also suggesting an interaction effect between *Eusing* and *Fxc*. The results presented in Table 5 support this hypothesis, revealing a significant interaction between *Eusing* and *Fxc* ($p > 0.05$). This relationship demonstrates the stronger relationship between *Eusing* and tourism expenditure in countries with no presence of exchange restrictions.

Although we observed that Fxc is not significant in the models in Table 4, which means that Fxc has no effect on our dependent variable, tourism expenditure (ITE). Now, in Table 5, we want to prove that the Fxc variable moderates the relationship between Eusing and ITE. Table 5 reveals, as we have commented, a significant interaction effect between Eusing and Fxc, that is to say, the interaction between Fxc and Eusing is significantly related tourism expenditure (ITE).

The results show that when obstacles are imposed on the realization of financial transactions, making payments to other countries difficult, commercial operations of a tourist nature decrease. Limiting or hindering payments for tourist operations or trips that the population is willing to carry out causes a decrease in these transactions, and citizens seek to make their transactions quick and easy. Before an increase in requirements, there is a fall in interest in carrying out these operations and in looking for other forms of leisure that do not involve these obstacles. Even when the population has easy access to the Internet, restrictions on making payments to other countries reduce their intention to travel and, therefore, also reduce spending on tourism.

As happened in the models of Table 4, the goodness of fit of models is high with the coefficients of determination above 78%, and all the models were found to fit the data with statistically significant *F*-statistics ($p < 0.001$).

Conclusions

With a sample of 95 economies for the period 2012–2017, this article offers an empirical analysis to study the effects of the level of population using the Internet on international T&T expenditures, and it introduces Fxc as a barrier to tourism e-internationalization and an issue not treated in-depth in previous literature.

Although the impact is weak, regression results show that a higher level of internet penetration or population using the Internet (*Eusing*) is associated with a significantly higher level of *ITE*. Exclusivity, do-it-yourself concept, differentiation and customized service are now closer than ever thanks to the use of the Internet.

Besides, the effect of *Eusing* on tourism expenditure is more pronounced in countries with no exchange restrictions. When *Eusing* is high, countries with no exchange restrictions report higher levels of ITE than countries with exchange restrictions. However, when *Eusing* is low, countries with exchange restrictions report lower levels of tourism expenditure than countries with no exchange restrictions. Thus, *Fxc* moderates the relationship between internet penetration and ITE. *Fxc* causes a weakening effect, so acting as a barrier to tourism e-internationalization.

Other key factors of *ITE* confirmed regardless of the model, are *GDP* per capita, *ITRs*, as well as *PriceC*. On the other hand, sociological factors such as *Education* and *CulturalR* show a strong significance in countries with low Eusing or with *Eusing* below the *Eusing* median value. *PDensity* and *CSize* are not confirmed as control variables in all the models.

Any economy focus on tourism as a source of income should promote the use of e-reservation and e-payments; therefore, Fxc are a challenge as they hinder the ability to trade in local markets.

From the point of view of e-commerce and international trading, many countries have Fxc, and their residents cannot buy lots of products and services over the Internet. Economies that today are subject to some degree of exchange restrictions and/or MCPs are an important potential market, which as soon as they can purchase international online shopping and will modify the volume and profitability of electronic transactions.

Likewise, those companies that are interested in offering their products and service online in those countries with Fxc should find ways to address this problem.

There are many opportunities for future research in this line, such as studying the effect of Fxc on other e-commerce sectors, such as retail clothing, or on total exports. It could be also interesting to analyze whether Fxc and internet penetration are related to a higher desire to access available but not accessible goods and services, which may, in turn, be related to other problems, including money laundering and the creation and development of black markets in currencies.

Besides, Governments also have to take into consideration that e-payments are easily verifiable by Public Administrations and it could be a useful tool to reduce tax fraud, so it could be also interesting to study the evolution of these indicators over time. Even the use of bitcoin or other digital and global money system currencies should be analyzed.

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