How important are borders for tourism? The case of Europe

Federico Carril-Caccia, José María Martín Martín, Francisco Javier Sáez-Fernández

University of Granada

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Abstract

Using a bilateral dataset of trips for 32 European countries for the period 2012-2019, we aim to gauge the size and evolution of the border effect on tourism: the extent to which domestic tourism is greater (or lesser) than international tourism. We found that the tourism flow within countries is 24 times greater than between countries. Also, we show that, relative to 2012, the border effect in 2019 diminished by 13%. Our results suggest that the size (and evolution) of the border effect is the same for those trips that last between 1 and 3 nights (short trips) and those that last 4 nights or more (long trips). Nonetheless, our findings point out that bilateral determinants that represent travel and transaction costs are more important to explain short trips than long ones.

Keywords: border, international tourism, Europe, gravity

Introduction

International tourism is a consolidated, rapidly expanding industry; since the 1950s tourism activities have increased by an average of 6% per year (Eriksen, 2016). It generates more than half a trillion dollars in annual revenues and represents 10% of total international trade and almost half of total trade in services (Eilat and Einav, 2004). Considering the global aggregate, tourism contributes, directly or indirectly, to 1 in 10 jobs, and is responsible for 10.3% of the global GDP (WTTC, 2020).

International mobility and borders are two inseparable concepts of analysis (Richardson, 2013), since, as pointed out by Rumford (2006: 155) "to theorize mobilities and networks is at the same time to theorize borders". Tourists are a particular type of mobile subject that crosses a world full of borders, their movements affect and are affected by the construction and performance of these borders (Rowen, 2016). Certainly, there is a vast academic literature that relates mobility to the performance of state borders (Parsley 2003; Dauvergne 2004; Salter 2006, 2008; Wonders 2006). Whereas the study of tourism flows in relation to the effect of borders has received very little attention (Rowen, 2016). Some studies have been published on the role of borders in encouraging or restricting tourism (Timothy, 2005; Timothy and Tosun, 2003; Sofield, 2006; Tubadji and Nijkamp, 2018), but the literature that quantifies the extent to which national borders condition tourism flows is very limited. This present paper seeks to fill this gap in the literature: to quantify the size and evolution of the border effect on international tourism.

From a theoretical point of view, the analysis of the impact of borders on international economic relations is simultaneous with the development of the economy as a discipline. However, empirical estimates of the border effect are relatively recent. The basic idea that gives meaning to the analysis of the border effect derives from the fact that borders represent a legal, physical, cultural and psychological barrier that hinders the exchange of goods, services, capital and people between countries, so that these exchanges will always be - everything else being equal - more fluid between regions in the same country than between territories in different countries. As in other areas of international economy, the border effect began to be estimated for the trade in merchandise (McCallum, 1995), subsequently being extended to other areas of international economic relations, such as trade in services (Anderson et al., 2018), foreign investments (Mayer et al., 2010), tourism (Paniagua et al., 2022) and forced migrations (Carril-Caccia et al., 2021).

This paper proposes a country-level study focused on a sample of European countries. The selection of this area is justified considering that, in terms of tourism, it forms a space for the free movement of people that is unique in the world. Therefore, legal and administrative restrictions are completely removed from the equation. Europe is a recognized tourism power, accounting for half of international tourism flows (UNWTO, 2019). For a large number of member states of the European Union (EU), tourism has been a major driver of economic growth and job creation (Salinas et al., 2020). Tourism contributes not only to the economic growth of countries and regions, but also to their social and cultural development and their general well-being (Martín et al., 2020). In particular, in the EU, borders have become, with regard to mobility and trade, symbolic representations of integration and cooperation (Więckowski, 2010). In addition, the implementation of the monetary union has broken down the intangible border associated with the different currencies in circulation, something that also drives tourist movements (Khalid et al, 2021).

To the best of our knowledge, Anderson et al. (2018) and Paniagua et al. (2022) are the only other works that have attempted to quantify the border effect on tourism. The present analysis contributes to the literature in four different ways. First, we focus on a sample of countries for which, during our period of analysis, there were no formal barriers to touristic flows. Second, we do not approximate domestic tourism; we use statistics that directly measure domestic and international tourism[1]. Third, the present work also contributes to the literature by quantifying the evolution of the border effect. Fourth, our analysis sheds new light on the different drivers of tourism depending on the length of the stay.

In the present work, for a sample of European countries, we estimate a structural gravity model with domestic and international tourism flows. Our analysis shows that domestic tourism is 24 times greater than international. In addition, our estimates indicate that the border effect is lower for long trips (trips that last 4 nights or more) than for short trips (trips that last between 1 and 3 nights), although the difference in size is not statistically significant. Furthermore, we demonstrate that between 2012 and 2019 for both, long and short trips, the border effect diminished by nearly 13%. In addition, our findings suggest that travel costs and transaction costs have a significantly greater impact on short trips than on long ones. Our results remain qualitatively and quantitatively unchanged when the sample is restricted to EU countries.

The following section provides an overview of the literature related to the drivers of tourism flows and the border effect. Section 3 presents the data and empirical strategy,

[1] Paniagua et al. (2022) demonstrate that the size of the border effect varies significantly depending on the method used to approximate domestic tourism, ranging from 19 to 117 (see Table 2 from Paniagua et al. (2022)). In contrast, Anderson et al. (2018) find a negative border effect

and Section 4 reports the results. The article ends with a discussion of the results and some concluding remarks.

The border effect on touristic flows

Historically, international touristic flows have increased as transport technology has evolved, but at the same time they have been hampered by the territorial rights exercised by sovereign countries through frontiers (Sofield, 2006). The generally accepted definition of international tourism includes the process of crossing the border from one country to another, staying at least one night (OMT, 1991), as well as the recreational and temporary nature of the trip (Hall, 2005).

The study of international flows and the border effect has experienced significant change in the last decades, as a result of international trade and flows of people and knowledge growing smoother and altering the traditional role of borders (Hageman et al., 2004). There are many academic papers on the implications for mobility of a reshaped world map resulting from decades of decolonization, territorial changes following the Cold War and the collapse of the Soviet Union, and regional integration processes. However, only a few studies specifically examine the role of borders on tourism. Some exceptions are the research conducted by Timothy (1999, 2001, 2005), Więckowski and Timothy (2021), Timothy and Tosun (2003), several of which have a qualitative nature.

The behaviour of tourists during their trips cannot be separated from the geographical, cultural and political conditioning factors on a national scale (Rowen, 2016). Borders are understood to be institutions that mark a functional barrier between countries, impose control over flows of people and trade, identify the entry point and facilitate contact and exchange (Hageman et al., 2004). International borders have geopolitical, historical and symbolic values and meanings (Więckowski and Timothy, 2021) which have an influence on tourists when choosing a destination. In a globalised world, the choice of a tourist destination is determined by a great variety of socioeconomic and environmental factors. This makes demand difficult to predict and it complicates tourism management (Albrecht, 2013; Liu et al., 2015; Song et al., 2017; van der Zee and Vanneste, 2015; von Bergner and Lohmann, 2014). The previously mentioned border effect can be produced in tourism by two types of factors: the administrative and physical elements that limit tourist movement and the psychological and perception elements that generate the image of crossing to another reality or into the unknown (Timothy and Tosum, 2003). This means that regions located in neighbouring countries have a lower level of interaction than expected (Smith, 1984; Timothy and Tosum, 2003).

Timothy and Tosun (2003) analysed touristic flows at the border of the United States and Canada. They concluded that borders can create real barriers that can be perceived by the traveller (even between countries with strong bonds of friendship and cooperation) due to the existence of economic and cultural differences, when there are security problems or when crossing procedures are tedious for the visitor. Sofield (2006) focused on border tourism and on the factors that can revitalize the roles of borders (such as international security problems and pandemics). More recently, Mayer et al. (2019) focused on this topic, whereas the attraction of travelling is, for some tourists, the fact of crossing a border and being immersed in a foreign culture while, for others, it could be a bother and cause anxiety. Therefore, as in the case of the previous literature on trade in merchandise and services, FDI and forced migration (e.g. Anderson et al., 2018; Carril-Caccia et al., 2021; Umber et al., 2014), we expect touristic flows to have a positive border effect. That is to say, after controlling for multiple drivers of international tourism, we expect domestic touristic flows to be greater than international ones. In addition, in line with previous works focused on international trade (e.g. Anderson et al., 2018; Bergstrand et al., 2015; Franco-Bedoya and Frohm, 2021), as a result of the advance of globalization, we expect to find a reduction in the border effect over time.

The hypotheses we posit are to a certain extent aligned with the previous findings by Anderson et al. (2018) and Paniagua et al. (2022). The first finds that the border effect has diminished for international trade in services, but also finds that for trade in travel services the border effect is negative. That is to say, after controlling for multiple drivers of international tourism, Anderson et al. (2018) find that international tourism is greater than domestic. Paniagua et al. (2022) find a positive border effect. Also, for two of the three proxies that domestic tourism authors' employ, they obtain results that suggest a reduction in the border effect. However, when Paniagua et al. (2022) proxy domestic tourism with the number of guests, their results suggest an increase in the border effect.

Methodology and data

Methodology

In the mid-1990s, taking the gravity models that had been used in economics since the 1960s as a basis -which in their simplest version consider that exchanges are directly proportional to the economic size of the countries and inversely proportional to the physical distance that separates them- the first estimations of the border effect were made for the Provinces/States of Canada and the USA (McCallum, 1995). The measurement was made by introducing a dummy in the gravity equation, which takes the value 0 for regions within the same country and 1 when the regions are separated by a border. Anderson and van Wincoop (2003) criticized the work of McCallum (1995) for being based on a gravity equation without theoretical foundations, which could introduce important biases in the estimates due to specification errors. Starting from the theoretical formulations of Anderson (1979) and Bergstrand (1985), Anderson & van Wincoop (2003) developed a new gravity model with theoretical foundations and tested it empirically. Bergstrand et al. (2015) set out to simultaneously measure the impact of trade integration agreements, borders, and physical distance on trade flows, concluding that previous estimates were biased upwards.

We use the gravity equation to estimate the border effect on tourism. Mimicking Newton's universal law of gravitation, the gravity model for tourism predicts that international travel will be positively moderated by the countries' economic masses (or population) and negatively by the geographic distance between them. This model has been widely and successfully used by previous literature that sought to explain the drivers of bilateral tourism (e.g. Gil-Pareja et al., 2007; Keum, 2010; Santana-Gallego and Paniagua, 2022). In addition, Morley et al. (2014) provided theoretical background that supports the use of the gravity equation for modelling tourism demand. We estimate the following equation:

$$Tourism_{ijt} = e^{\begin{pmatrix} \alpha Border_{ij}+\beta_1 Distance_{ij}+\beta_2 Contiguity_{ij}+\beta_3 Religion_{ij}+\beta_4 Language_{ij} \\ \mu_1 EMU_{ijt}+\mu_2 Migration_{ijt-3}+\lambda_{it}+\lambda_{jt} \end{pmatrix}} * \varepsilon_{ijt} \quad (1)$$

where $Tourism_{ijt}$ is the number of tourism trips from country i to country j in year t. The dependent variable includes domestic ($i = j$) and international ($i \neq j$) trips. $Border_{ij}$ is a dummy variable that takes the value 1 when i and j are the same country, and 0 when the tourist trips are international ($i \neq j$). Accordingly, the coefficient α gauges the extent to which domestic tourism is greater (or lesser) than international. The equation also includes bilateral time-invariant determinants of tourism (e.g. Khadaroo and Seetanah, 2008; Patuelli et al., 2013; Tubadji and Nijkamp, 2018); the logarithm of geographic distance, contiguity and language, which are indicator variables that respectively have a value of one if a country pair share a geographic border and language, and a religion similarity index.

The Border and Contiguity are different explanatory variables. The first quantifies the relevance of internal flows relative to international ones, while Contiguity represents the effect that sharing a geographic border with another country has on international flows. Accordingly, the coefficient associated to the Border (α) quantifies the extent to which domestic tourist trips are larger (or smaller) than international ones. In other words, the preference and/or capacity that tourist have for crossing their country's border for travelling to a foreign country. The coefficient associated to the Contiguity dummy (β_2) assesses the degree in which sharing a geographic border between two countries, such as Portugal and Spain, affect bilateral tourism between both.

EMU_{ijt} is an indicator variable that has a value of one if countries are members of the European Monetary Union (EMU). Sharing a currency can benefit tourism as it eliminates exchange rate volatility, reduces transaction costs and improves the transparency of markets. In summary, the adoption of a common currency between a pair of countries can reduce the costs of tourism between them. In this regard, Gil-Pareja et al. (2007) and Santana-Gallego et al. (2016) demonstrate that the adoption of the Euro had a positive effect on tourism flows between EMU members.

$Migration_{ijt-3}$ is the logarithm of the population of migrants from country i that live in country j in the year $t-3$. Santana-Gallego and Paniagua (2022) argue that migration can foster tourism through three different channels. First, migrants can reduce the bilateral information asymmetries that might exist between their country of origin and their host country, in this way making it easier to travel from one country into another. Second, migrants can also directly and indirectly diminish the costs associated with travelling. They can directly reduce the costs of travelling by offering cheaper or free accommodation to their compatriots, and indirectly as they intensify transport connections between a pair of countries and in this way reduce transport costs. Third, migrants can promote their new home country in their country of origin as an attractive destination to visit.[2] The theoretical framework and empirical evidence presented by Santana-Gallego and Paniagua (2022) support this positive link between tourism and migration.[3]

Since our analysis covers the 2012-2019 period for a sample of highly integrated European countries, we do not need to control for other relevant time variant bilateral drivers of tourism such as trade agreements or the cost of visas (Balli et al., 2013; Santanga-Gallego et al., 2016).

Equation (1) includes origin country-year fixed effects (λ_{it}) and destination country-year fixed effects (λ_{jt}). Both respectively absorb all origin and destination country level

[2] As pointed by Santana-Gallego and Paniagua (2022), even after including country pair fixed effects there is room for a potential endogeneity bias between tourism and migration. To minimize the potential reverse causality between both variables, we use migration stock data and lag the migration variable. Compared to migration flows, a country's inward migration stock is likely to be much less affected by changes in tourism flows. Also, lagging the migration stock variable makes it less likely that past changes in migration stock to be driven by contemporaneous variations in touristic flows.

[3] The positive link between tourism and migration is analogous to the one previously reported for the case on the international trade and migration (e.g. Head and Reis, 1998) and FDI and migration (e.g. Tong, 2005).

time-varying drivers of tourism flows identified by the previous literature, e.g. population, GDP per capita, happiness, accommodation capacity, violence, institutional quality, and price (e.g. Balli et al., 2016; Dogru et al., 2017; Llorca-Vivero, 2008; Paniagua et al., 2022; Xu et al., 2019). Thus, country specific time varying variables, such as GDP, are not included in the gravity equation as they are collinear with the origin country-year fixed effects and destination country-year fixed effects. More importantly, these fixed effects account for the multilateral resistance term (MRT) of the origin and destination countries (Anderson and van Wincoop, 2003; Fally, 2015). This implies controlling for the remoteness of two country pairs to other possible destinations. That is to say, the MRT controls for the relative capacity of travelling from a given country in comparison to the rest of the world. Likewise, the destination countries' MRT controls for the relative capacity of a country to attract tourists relative to the rest of the world (Harb and Bassil, 2020; Santana-Gallego and Paniagua, 2022). Not controlling for the MRT results in biased estimates (Head and Mayer, 2014). Finally, ε_{ijt} is the disturbance term.

In this paper the concept of distance is addressed from a spatial point of view, although there are other non-physical factors that increase the perception of distance between two countries (Popli et al., 2016). These factors correspond to social and cultural differences that can modify human and economic interactions between territories (Björkman et al., 2007; Basuil & Datta, 2015), acting as a mental barrier (Maddux & Galinsky, 2009). Hence, the importance of including in the analysis elements such as language, social values, cultural aspects, religion or contiguity, which in a way capture distances/cultural frontiers, as this paper proposes. In the European context, there are several forces that condition - in different ways - the non-physical and non-political barriers between countries. Such as the creation of a European identity and policies that encourage interaction between citizens and companies, the reinforcement of national identity and the homogenization processes associated with globalization (Weidenfeld, 2013).

Equation (1) is estimated to gauge the size of the border effect. Equation (2) measures the evolution of the border effect during our period of analysis:

$$Tourism_{ijt} = e^{(\alpha_t Border_{ij} * D_t + \mu_1 EMU_{ijt} + \mu_2 Migration_{ijt-3} + \lambda_{ij} + \lambda_{it} + \lambda_{jt})} * \varepsilon_{ijt} \quad (2)$$

As in Bergstrand et al. (2015) the $Border_{ij}$ dummy interacts with a dummy variable that takes a value of one when the observation is from year t (D_t). The estimated coefficient α_t measures the change in the border effect in year t relative to the base year. This empirical strategy has also been adopted in other works that address the evolution of the border effect for trade, migration and FDI (Anderson et al., 2018; Bergstrand et al., 2015; Franco-Bedoya and Frohm, 2021; Head and Mayer, 2021). In equation (2), bilateral time-invariant determinants of tourism are replaced with country-pair fixed effects (λ_{ij}). These fixed effects reduce the omitted variable bias and the endogeneity that there is between tourism flows and sharing a currency (Baldwin and Taglioni, 2006; Santanga-Gallego et al., 2016). In consequence, they allow us to better approximate the change in the border effect over time. Nonetheless, country-pair fixed effects are collinear with the $Border_{ij}$ dummy, thus equation (2) does not provide any insight regarding the size of the border effect.

Equations (1) and (2) are estimated with the Pseudo Poisson Maximum Likelihood (PPML) estimation. Since the work from Santos-Silva and Tenreyro (2006), the PPML has been the standard estimator for the gravity model. The estimator allows estimation of a log linear model at the same time that we are able to conserve the zeros usually present in bilateral data and to overcome the heteroskedasticity problems usually present with Ordinary Least Squares. Following Egger and Tarlea (2015), robust standard errors are multiway clustered at the origin and destination country. We use the PPML high-dimensional fixed effects estimator from Correia et al. (2020).

Data overview

The data about international and domestic tourism is from Eurostat. We used a bilateral dataset of the number of tourists between 29 source and 32 destination European countries for the period 2012-2019 (The list of countries and details on the treatment of the tourism data are available on the appendix). With the Eurostat data we can have separate statistics for the number of tourists according to different lengths of stay: the number of tourists that stayed between one and three nights and the number that stayed four or more nights. A limitation of our data is that it does not account for tourists spending their trip in establishments that are outside the market (e.g. a family house). This limitation is likely to be present in both, international and domestic trips, however it might be more important in the case of domestic trips. Nonetheless, our database should be useful to compare domestic and international tourism that is measured in a homogeneous way.

Graph 1 illustrates the evolution of the ratio of international-domestic tourists by different lengths of stay. As expected, independent of the length of stay the number of domestic tourists is significantly larger than the number of international ones. Nevertheless, the difference is smaller for tourists that stay four or more nights. On average, for each one hundred domestic tourists that stay one to three nights, there are nearly fifteen that holiday abroad. For each one hundred domestic tourists that stay four nights or more, nearly fifty-seven stay abroad. In both cases there appears to be a positive trend in the ratio of international-domestic tourists, growth being more marked for the case of tourist trips that last four nights or more. Alternatively, Table 1 shows that on average the number of tourists that stay between one and three nights is larger than the number of tourists that stay four nights or more. Short trips are more frequent and more likely to occur domestically than longer ones.

The variables on geographic distance, contiguity, religion similarity and language were obtained from the CEPII database (Head et al., 2010). Geographic distance between countries is the population-weighted distance between the most populated cities measured in kilometres. Contiguity is an indicator variable that takes the value 1 when two countries share a geographic border. The religion similarity index is obtained by adding the products of the shares of the different religions in the origin and destination countries. It is an index that can take a value between 0 and 1, the higher the value of the index, the higher is the religious similarity between a pair of countries. Language is a dummy variable that takes the value 1 when two countries share the same official or primary language. The EMU variable was constructed by the authors. This variable takes 1 whenever two countries are members of the European Monetary Union. Data on the stock of international migrants and domestic non-migrant population is obtained from Eurostat. For some countries, missing data on domestic non-migrant population is imputed using population data net of international migrants obtained from World Bank's Development Indicators[4]. Descriptive statistics are available in Table 1.

Graph 1.

Table 1.

[4] This imputation strategy affects 72 observations.

Results

Table 2 presents equations 1 and 2, regressions for the number of tourist trips of one night or more. For both, we estimate for the whole sample (columns 1 and 3) and a restricted sample that only includes EU countries (columns 2 and 4). Estimates in column 1 show a negative relationship between geographic distance and tourist trips, while religious affinity and sharing a language have a positive significant effect. Sharing a geographic border has a non-significant effect. Results for the EU sample are similar; the only difference is that religious affinity looses significance.

Columns 3 and 4 show that being a member of the EMU has a significant, positive effect on the number of tourism trips. [5] The positive effect of the EMU on the number of tourists trips is aligned with the previous literature that shows the positive effect that the EMU has among country members on tourism, international trade, cross-border M&As, bonds and equity holdings (e.g. Coeurdacier and Martin, 2009; Coeurdacier et al., 2009; Gil-Pareja et al., 2007; Glick and Rose, 2016).

Estimates in columns 3 and 4 indicate that the stock of migrant population from country i in country j is positively correlated to the number of tourist trips. This positive and significant link between tourism and migration is sensitive to the number of years in which we lag the migration stock variable. The variable remains to be positive and significant in $t-2$, but loses significance when is included in the model in years t, $t-1$ and $t-4$. Estimates of the remaining independent variables remain identical to the

[5] Column (3) shows our preferred estimate of EMU and migration, since the inclusion of country pair fixed effects mitigates the potential endogeneity issues that there are between these two independent variables and our dependent variable.

ones presented in table 2. To conserve space, this robustness analysis is available under request.

Regarding the border effect, columns 1 and 2 from Table 2 corroborate that even in the case of analyzing a sample of highly integrated countries, there is a stronger preference for travelling domestically than internationally. Our estimates show that domestic trips are between 23 ($e^{3.1396}$) and 24.5 ($e^{3.1983}$) times greater than international ones. Based on this, we did not find that the border effect is statistically different between the full sample and the sample restricted to EU countries.[6]

Graph 2 illustrates the evolution of the border effect relative to the base year 2012. These estimates are obtained from equation 2 (column 3). The results show that during the years 2014-2016 there was no significant change in the border effect. However, in years 2018 and 2019 there was a reduction in the border effect of 11% ($e^{-0.1170} * 100$) and 12.8% ($e^{-0.1368} * 100$) respectively relative to 2012. As in the case of the border effect, we find that there are no significant differences between the evolution of the border effect of the whole and EU sample (to conserve space, in the appendix there is a graph that illustrates the evolution of the border effect of both samples).

Table 3 shows the estimates of equations 1 and 2 for the number of tourist trips of one to three nights (columns 1 and 2) and for the number of tourist trips of four nights or more (columns 3 and 4). Depending on the length of the stay, the results show that there are some statistically significant differences between the drivers of tourist trips. For short stays, one to three nights, the negative effect of geographic distance is almost three times larger than for longer stays (-1.5036 vs. -0.6370). In this line, for shorter stays

[6] We use Stata's *suest* command to test if there are statistical differences between coefficients from different regressions.

being an EMU member, and sharing a common geographic border and religious affinity are significant drivers of tourist trips, while they are not significant in the case of longer stays. In addition, having a common language has a greater positive effect for one to three night trips (1.5257 vs. 1.0794). In this way, the results seem to indicate that for short period trips tourists prefer to travel to places with which they have lower travel and transaction costs. On the other hand, the migrant population is only positive and significant when considering the number of four nights or more trips.

In terms of the border effect, estimates from Table 3 are to a certain extent aligned with the descriptive statistics reported in Graph 1. The preference for making domestic tourists trips is greater for short trips than for long trips. For trips of one to three nights, estimates show that domestic trips are 24.2 ($e^{3.1849}$) times greater than international ones. For trips of four nights or more, estimates indicate that domestic trips are 19.9 ($e^{2.9924}$) times greater than international ones. Nonetheless, the difference in the border effect size is not statistically significant.

Graph 3 presents the evolution of the border effect relative to the base year 2012 for those trips that last between one and three nights and those that last four nights or more. Estimates are obtained from columns 2 and 4 respectively. In both cases, there is a reduction of the border effect, in 2019 they are respectively 10.9% ($e^{-0.1156} * 100$) and 13.4% ($e^{-0.1435} * 100$) lower than in 2012. However, the estimates show that there are no significant differences in the evolution of the border effect between both.

Table 2:

Graph 2:

Table 3.

Graph 3.

Discussion and conclusions

The study of the factors that influence international tourism flows is an object of increasing attention. In the past two decades, a lot of empirical works have emerged; most of them based on gravity models, which try to explain the general patterns observed in tourist movement on a global scale. This research is intended to contribute to that existing literature. It presents a gravity model with domestic and international tourist flows for a sample of 32 European countries for the period 2012 - 2019. Generally, referring to the most conventional hypothesis, our results are in concordance with the previous literature. Tourist flows are sensitive to physical distance, religious and linguistic affinity, the fact of sharing the same currency, and the previous existence of a certain stock of migrant population.

Regarding our most novel hypothesis, the reached results indicate that the border effect is a factor that greatly influences the travel decisions of tourists. Our results prove that domestic tourism is between 19 and 24 times higher than international tourism. Furthermore, in consonance with globalization, it was found that there was a reduction of that border effect between 2012 and 2019. This means that the tendency of the border effect to diminish could probably also be explained by the very same reasons that explain its loss of significance in commercial exchanges (reduction relating to international transport cost, opening of borders in the globalization scenario, etc.).

In addition, considering the type of trip and as economic intuition suggests, the negative effect of geographic distance on shorter trips is greater than on longer trips, while sharing a currency or language, having a common border, and having a religious affinity might have a greater positive effect on shorter trips. As far as the migrant population is concerned, it only seems to have a positive influence on long trips. Stated briefly, our results indicate that tourists prefer to incur lower travel and transaction costs when making short trips. However, we find no evidence that the border effect differs according to trip length.

These results could be relevant when it comes to designing tourism promotion policies by governments, and defining business strategies in order to attract travellers. The variables influencing short and long trips are significantly different in each case, and the source markets of tourists may necessarily be oriented towards one or the other travel mode, as is the case, for example, with transatlantic trips, which logically need to be scheduled for more days. The lure of a common language and culture may be relevant in certain markets or types of travel, but be much less relevant in other cases. Promotional campaigns for specific dates (weekends, special events such as fairs, exhibitions, etc.) may make sense in certain countries or types of travel, but not in others. In conclusion, policy makers and tourism businesses need to be aware of the differences in the factors influencing different types of travel in order to develop effective and efficient policies and business strategies.

Considering previous literature, we found that the border effect is close to the lower rank of the estimations given by Paniagua et al. (2022). The aforesaid work found that the border effect swings in such a manner that residential tourism flows are between 19 and 117 times greater than international ones. The rank of estimations of Paniagua et al. (2022) is determined by the different strategies used to approach residential tourism. In other matters, as opposed to Anderson et al. (2018) and the travel trade, we can see a positive frontier effect.

Furthermore, our estimates indicate that the border effect on tourism is greater than for international trade and FDI, but lower than for forced migration. Bailey et al. (2021) show that domestic trade is 5 to 9 times greater than international. Umber et al. (2014) conclude that domestic M&A is 6 times greater than cross-border. Carril-Caccia et al. (2021) found that domestic forced migration is 42 times greater than international. This is probably due to the greater subjective effect that frontiers have on personal decisions regarding travelling. Therefore, aligned with the previous literature on trade and forced migration (Anderson et al., 2018; Bergstrand et al., 2015; Carril-Caccia et al., 2021; Franco-Bedoya and Frohm, 2021; Head and Mayer, 2021), we also observe a decline over time in the border effect on tourism.

Finally, we should highlight that this work focuses on a geographic field and a quite homogeneous period of time from an economic, political, health and safety point of view. This homogeneity, most likely, is behind the strength of the obtained results. Nonetheless, at the same time, it constitutes a limitation of our analysis, due to the lack of diversity that stops our models from capturing more precisely the effects of cultural differences, administrative constraints, migratory flows, pandemics, the political situation and global security at a global scale. All of this indicates that we should increase the sample of countries and the analysed period of time in future works, contemplating them from an intercontinental perspective and covering more heterogeneous periods. Moreover, future research could address different dimensions that can potentially moderate countries' border effect. For instance, countries' border effect could be moderated by the cultural differences or social ties that there are between country pairs. In addition, country level factors, such as institutional quality or the number of World Heritage sites, could also affect the size of the border effect.

Declaration of competing interest: None.

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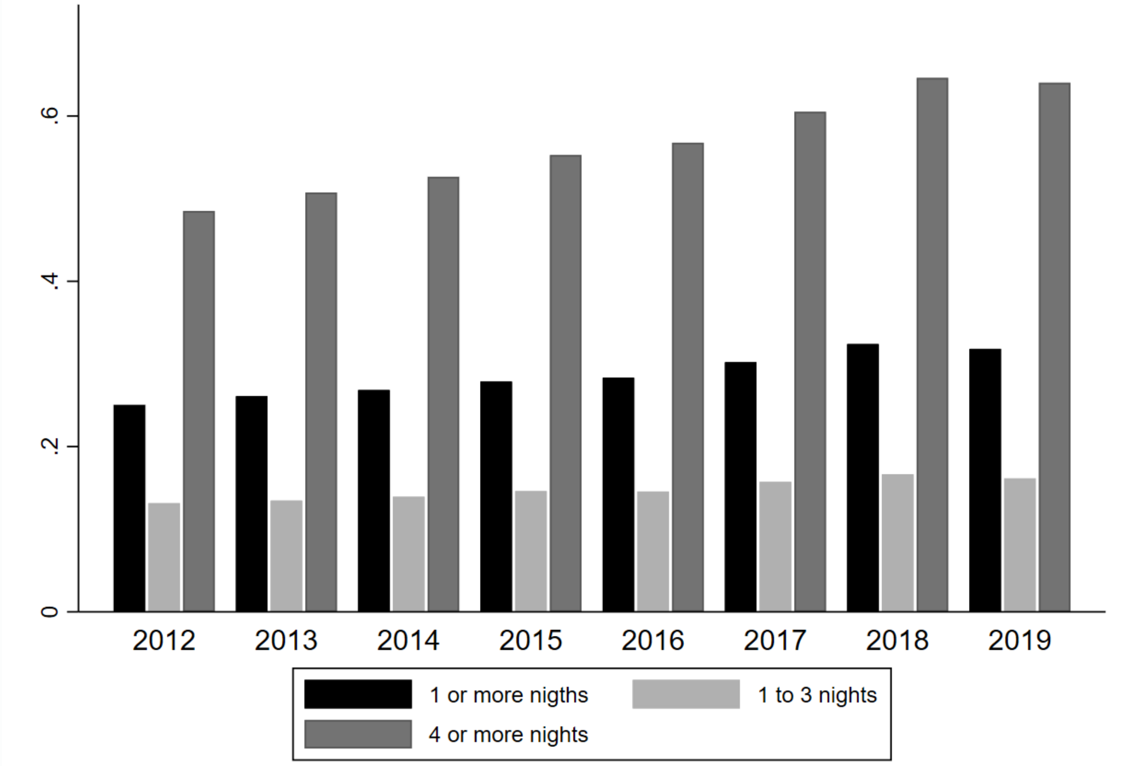
Graph 1. Ratio of international-domestic tourists



Source: The Authors. Data from Eurostat.

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
No. Tourists: 1 or more nights	5,483	1526.795	11234.93	0.175	200379.7
No. Tourists: 1 to 3 nights	5,401	925.8511	7365.677	0.001	114649.5
No. Tourists: 4 or more nights	5,401	622.608	4106.766	0.031	86881.88
Border	5,483	0.042	0.200	0	1
Log(Distance)	5,483	6.946	0.752	2.134	8.286
Contiguity	5,483	0.122	0.327	0	1
Religion	5,483	0.319	0.303	0	0.956
Language	5,483	0.054	0.227	0	1
EMU	5,483	0.350	0.477	0	1
Log(Migration)	5,483	6.787	4.147	0	18.226

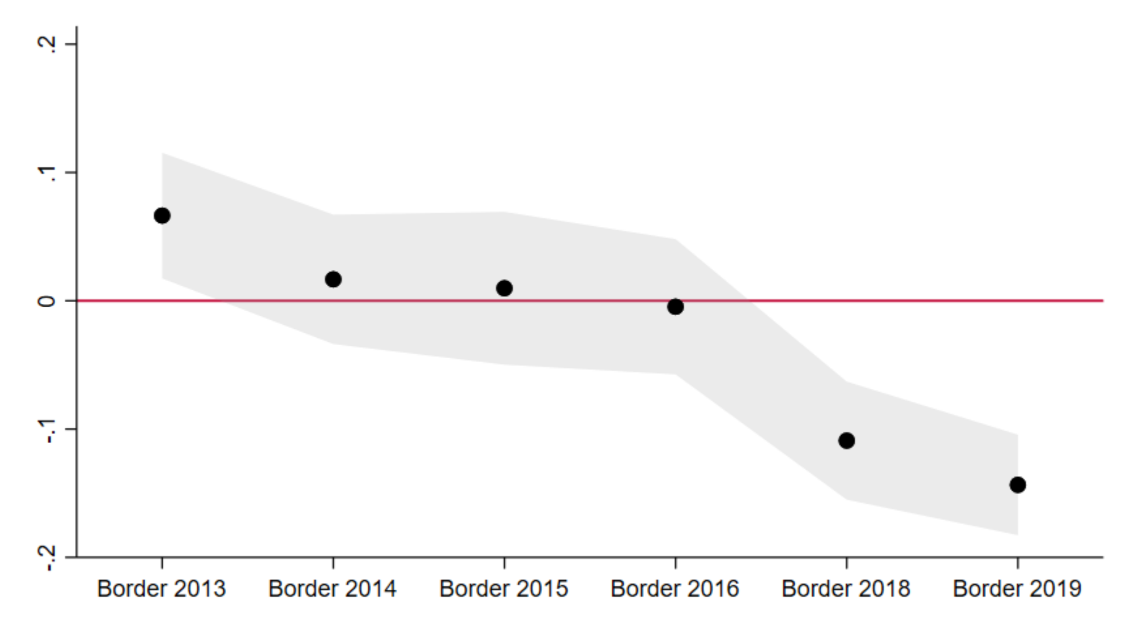
Source: the authors. The number (No.) of tourists is reported in thousands.

Table 2: The border effect on tourism trips of one night or more

	(1) Equation 1	(2) Equation 1-EU	(3) Equation 2	(4) Equation 2-EU
Border	3.1983[a]	3.1396[a]		
	(0.386)	(0.338)		
Log(Distance)	-0.9784[a]	-1.0577[a]		
	(0.179)	(0.174)		
Contiguity	0.0901	0.0437		
	(0.160)	(0.162)		
Religion	0.4825[c]	0.3869		
	(0.259)	(0.263)		
Language	1.2776[a]	1.3410[a]		
	(0.108)	(0.155)		
EMU	0.4050[a]	0.4546[a]	0.0906[b]	0.0989[a]
	(0.084)	(0.095)	(0.039)	(0.038)
Log(Migrant population t-3)	-0.0035	-0.0034	0.1134[b]	0.1040[c]
	(0.031)	(0.028)	(0.050)	(0.053)
Observations	5483	4539	5450	4516
Origin-year FE	Yes	Yes	Yes	Yes
Destination-year FE	Yes	Yes	Yes	Yes
Country pair FE			Yes	Yes
Border-year			Yes	Yes

Note: Standard errors clustered at origin and destination level are in parentheses; a, b, c: statistically significant at 1%, 5%, and 10%, respectively. Estimates from the border-year dummies are reported in graph 2 and graph A in the appendix.

Graph 2: Evolution of the border effect on tourism trips of one night or more



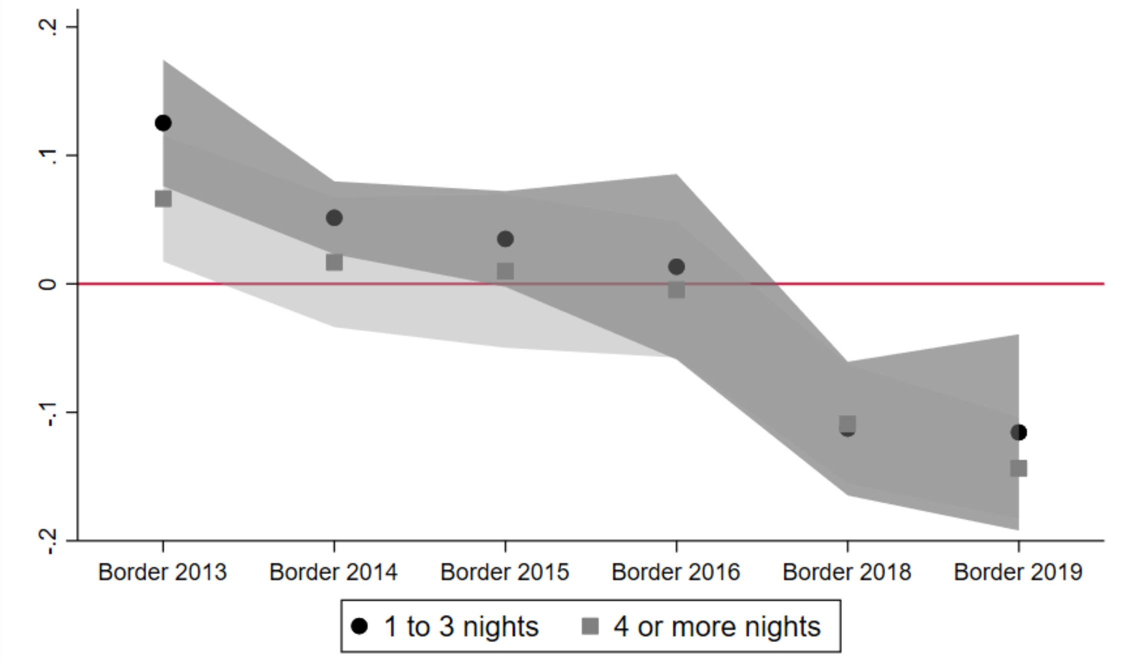
Note: Evolution of the border effect, 2012-2019. Change of the border effect relative to the border effect in 2012. Coefficients are obtained from estimating equation 2 with the whole sample.

Table 3. The border effect on tourism trips of one to three nights and four or more nights

	(1)	(2)	(3)	(4)
	One to three nights		Four or more nights	
	Equation 1	Equation 2	Equation 1	Equation 2
Border	3.1849[a]		2.9924[a]	
	(0.439)		(0.414)	
Log(Distance)	-1.5036[a]		-0.6367[a]	
	(0.202)		(0.193)	
Contiguity	0.2535[b]		0.0203	
	(0.113)		(0.167)	
Religion	1.0642[a]		0.1636	
	(0.251)		(0.279)	
Language	1.5257[a]		1.0794[a]	
	(0.118)		(0.133)	
EMU	0.2954[a]	0.0817[b]	0.4347[a]	0.0966
	(0.114)	(0.037)	(0.099)	(0.067)
Log(Migrant population t-3)	-0.0151	0.1364	0.0068	0.1050[b]
	(0.023)	(0.104)	(0.040)	(0.044)
Observations	5401	5396	5401	5396
Origin-year FE	Yes	Yes	Yes	Yes
Destination-year FE	Yes	Yes	Yes	Yes
Country pair FE		Yes		Yes
Border-year		Yes		Yes

Note: Standard errors clustered at origin and destination level are in parentheses; a, b, c: statistically significant at 1%, 5%, and 10%, respectively. Estimates from the border-year dummies are shown in graph 3.

Graph 3. Evolution of the border effect on tourism trips of one to three nights and 4 nights or more



Note: Evolution of the border effect, 2012-2019. Change of the border effect relative to the border effect in 2012. Coefficients are obtained from estimating equation 2 with the whole sample.

Appendix

A note on tourism data

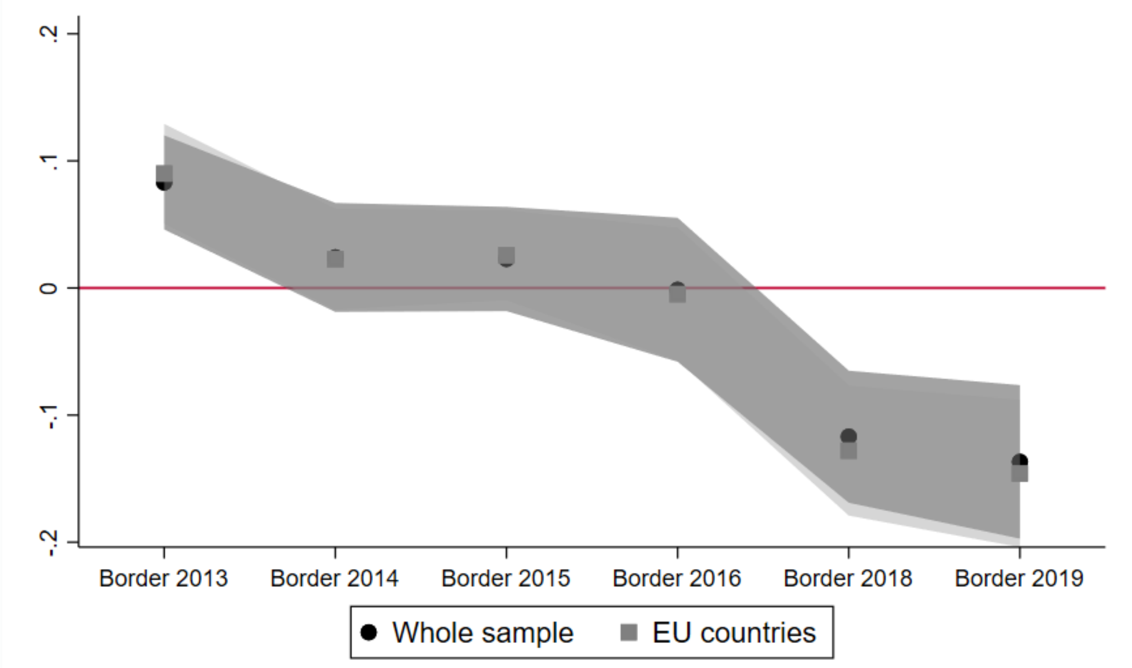
We limit the sample of analysis to only those bilateral observations in which there is different data available for trips that last 1 night or more, 1 to 3 nights and more than 4 nights. This is done with the aim of basing the analysis in a sample that is comparable in each case. In this way, we also attempt to limit the potential mistakes that might be present in the raw data. For instance, there are cases that for a year report the exact same number of tourist trips that stay more than one night, and more than 4 nights, we believe that this is quite unlikely. In addition, using the data for the different lengths of stay we impute some missing observations. For example, if there is missing data on the number of tourists that stayed between 1 to 3 nights, we imputed this missing data available with the difference on the number of tourists that stayed more than 1 night and more than 4 nights. This imputations strategy leads to increase our sample of analysis by approximately 100 observations.

Table A: Country sample

Austria	Finland	Latvia	Romania
Belgium	France	Lithuania	Slovakia
Bulgaria	Germany	Luxembourg	Slovenia
Croatia	Greece	Malta	Spain
Cyprus	Hungary	Netherlands	Sweden
Czechia	Iceland	Norway	Switzerland
Denmark	Ireland	Poland	Turkey
Estonia	Italy	Portugal	United Kingdom

Due to data limitations Iceland, Turkey and United Kingdom are only included in the sample of analysis as destination countries.

Graph A: Evolution of the border effect on tourism trips of one night or more, whole and EU sample



Note: Evolution of the border effect, 2012-2019. Change of the border effect relative to the border effect in 2012. Coefficients are obtained from estimating equation 2 with the whole and EU sample.

Table B: The border effect on tourism trips of one to three nights and four or more nights, EU sample

	(1)	(2)	(3)	(4)
	One to three nights		Four or more nights	
	Equation 1	Equation 2	Equation 1	Equation 2
Border	3.0082[a]		2.9822[a]	
	(0.310)		(0.395)	
Log(Distance)	-1.6217[a]		-0.7123[a]	
	(0.193)		(0.194)	
Contiguity	0.1962[c]		-0.0205	
	(0.111)		(0.176)	
Religion	0.8705[a]		0.0600	
	(0.227)		(0.304)	
Language	1.6073[a]		1.1484[a]	
	(0.196)		(0.214)	
EMU	0.3070[b]	0.0742[b]	0.5053[a]	0.1440[b]
	(0.143)	(0.034)	(0.112)	(0.059)
Log(Migrant population t-3)	-0.0078	0.1297	0.0025	0.0886[c]
	(0.020)	(0.109)	(0.036)	(0.047)
Observations	4495	4490	4495	4490
Origin-year FE	Yes	Yes	Yes	Yes
Destination-year FE	Yes	Yes	Yes	Yes
Country pair FE		Yes		Yes
Border-year		Yes		Yes

Note: Standard errors clustered at origin and destination level are in parentheses; a, b, c: statistically significant at 1%, 5%, and 10%, respectively.