The Impact of the Collaborative Economy in the Tourism Industry: Creative Destruction or Mere Substitution?

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Abstract

The collaborative economy has emerged as a disruptive innovation transversally affecting several industries and causing a fiery discussion both in the public opinion as in academic literature, that has as many advocates for this sector as it has detractors. Previous research on the topic has analyzed the impact these innovative platforms have had over the hotel industry. However, its impact on the tourism industry as a whole has not yet been looked into. This research intends to fill this gap and deepen in the impact of the collaborative economy in the tourism industry by analyzing the international tourist flows to Spain over the period 2006-2019. This is executed by the means of different dynamic data-panel and random effects GLS panel models. Results reveal a significant and positive impact of the collaborative economy in the tourist flows and therefore concluding that, independently of its effect in the hotel industry, it has indeed cherished growth in the tourism industry as a whole.

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1. Introduction

The collaborative economy is a fascinating phenomenon that has experienced a singular upsurge in the last decade, disrupting tens of traditional industries but heartening thousands as a potential rule changer for an unsustainable economy and as a facilitator agent of a much needed ecological transition. The collaborative economy has long existed but experienced a boom due to the development of the information and communication technologies and the digital transformation. The focus of the collaborative economy is on the optimization of idle physical assets, such as apartments, vehicles, goods and capital, as well as intangible, such as knowledge or abilities (Benkler, 2004). From this premise, and through innovation in business models and services, different companies have managed to optimize idle assets existing in the market, facilitating its access to individuals and organizations that may need them, normally by the means of a digital platform.

The creative destruction caused by the collaborative economy has impacted many industries but has found particularly fertile soil in the tourism industry, offering what many argue is a more authentic and economical alternative to traditional lodging. The tourism industry is the driver of many economies across the globe and its contribution to economic growth is of major significance. In their participation in the collaborative economy by opening their homes to travellers, local communities are directly extending the receptive capacity of destinations globally. Additionally, they are lowering costs for travel services, both by offering a more economical lodging alternative than hotels and by increasing offer and competition. Last, these local collaborative economy communities are seizing the consumers changing tastes, offering an authentic local experience and interaction travellers hardly had access to before.

In this way, the objective of this research is to examine whether the emergence of the collaborative economy has fostered international incoming tourism, therefore contributing to national economic growth, and if so, to which extent. Aiming to answer this research

question, several panel-data analysis will be conducted. The delimitation of this research will be Spain, but it is expected that the results may be extrapolated to other countries.

Understanding the impact of the collaborative economy in the tourism industry has enormous relevance to the industry's stakeholders, policymakers, local communities and entrepreneurs. The collaborative economy has as many positive externalities as it has negative. Its specific impact in the environment, employment, touristification, among others, is discussed in the following section. However, unveiling whether these innovative business models, specifically in the accommodation sector, have only acted as a mere substitute for traditional lodging products or as well fostered international tourist flows will help create a larger view of this growing phenomenon.

This research intends to make a contribution to academic literature in the following regards. First, to better understand the impacts of the collaborative economy innovation in economic growth and particularly, in the tourism industry development. Second, to provide further evidence on how the creative destruction caused by innovation may cherish growth. Last, this paper aims to contribute to the understanding of the changing tourism demand factors.

The paper will be structured as follows. First, a background will be presented in section 2, aiming to offer contextualization of the collaborative economy. This section will also cover a review of the discussions in academic literature over the topics of the collaborative economy, its place in innovation and the economic growth that it could represent, giving voice both to its promoters and to its detractors. This section will also review academic literature that has deepened in a similar research question as the one here discussed and assess the methodology therein employed. Following, section 3 offers a methodological approach so as to explain the impact of the collaborative economy on tourism. In this section, the details on the framework and econometric model will be presented, as well as an explanation on the data and data sources that nurture the analysis. Section 4 exhibits the results of the analysis, complemented by a discussion over those results presented in section 5. The main conclusions of the study will be summed in section 6. Last, sections 7 and 8 present the references and annexes of this research.

2. Background

Recent developments in the literature on the field of economics and innovation have provided a new perspective for understanding innovation as a shifting agent in the trajectory of knowledge, and therefore, the key to understanding its directionality. This new wave for studying innovation sees it as an enabler of the changes that society needs (Fagerberg, 2017) and as the definite way policy-makers could tackle the great challenges, such as sustainability or the fight against poverty (Mazzucato et al, 2019; Mazzucato and Jacobs, 2016; Nidumolu et al, 2009). This perspective is complemented by the forecast of a new globalization process that will bring faster and more disruptive changes affecting mostly the services sector (Baldwin, 2017). Innovation in the services sector has long been studied and its increasing relevance towards productive systems and to the generation of growth cycles has been already confirmed (Barras, 1986; Gallouj and Weinstein, 1997). More recent studies have portrayed the "servicisation" of society (Toivonen and Tuominen, 2009) and suggested that additional to this macroeconomic and social development, innovation in services contributes to the tendency towards a knowledge-intensive economy in which companies play an essential role as knowledge brokers (Hipp and Grupp, 2005). But in order for this to happen, companies need to reinvent themselves and find opportunities to satisfy a societal need by, at the same time, monetizing over new technologies (Baden-Fuller and Haefliger, 2013). This innovation in business models is altering the regimes that established the rules of certain industries and transforming the balance between consumers and suppliers in the knowledge society (Trimi and Berbegal-Mirabent, 2012). The creative destruction that this innovation in business models implies could also be interpreted as the necessary steps to build an ecological transition (Schaltegger et al, 2016; Boons and Lüdeke-Freund, 2013) and to achieve a more inclusive growth where lower-income sectors are targeted and can access goods and services that were, previously, out of their reach (Foss and Saebi, 2016). In this context, the collaborative economy could be of major importance as a means to an ecological transition of inclusive growth by guiding companies and entrepreneurs to innovate in business models focused on the great challenges that our society faces.

The collaborative economy is still emerging as a field of research and may be found in the literature under many names, such as collaborative economy, sharing economy, gig economy, peer-to-peer economy, access economy and collaborative consumption, among others. Although the variety of names could be due to a lack of consensus product of its novelty, all these concepts vary slightly in their definitions, each including or excluding a certain type of activity (Acquier et al, 2019). To the effect of this research, a broad definition will be considered, understanding the collaborative economy as such where the focus is on the optimization of underused assets (such as goods, productive capacities, vehicles, liquidity, apartments or space in an apartment) and two parties with symbiotic capacity and necessity collaborate, normally connected through a digital platform. The collaborative economy became a label to refer to those interactions that allow individuals and companies to connect with others so as to exchange, rent, lend, gift or share a good or service, providing access to it, but not property (Gansky, 2012).

The study of the collaborative economy is particularly interesting since it operates both under market and non-market logics. In it, it is possible to find both an economic transaction for the provision of a service as well as the same service being delivered with no economic retribution, representing no gain for the service provider other than the opportunity to be of help (Acquier et al, 2016). The collaborative economy supposes a potential transformation of consumption and production as we know it, contributing to avoiding superfluous overproductions and, therefore, gaining a place as a promising format for the green revolution. In addition, collaborative economy platforms also become players with social orientation, since they foster value co-creation and sharing opportunities inside and amid societies.

Due to the wide variety of activities that the collaborative economy encompasses, the actors taking action in it are normally confusing. The collaborative economy includes many types of collaboration that may seek a cost reduction, a higher competitiveness, achieve economies of scale, reduce the ecological impact of one's consumption or even just the generation of a complementary income. The relationships may be of different forms. The collaborative economy includes business to business (B2B) relationships, such as the services provided by co-working companies, sharing office space to optimize the resources. It also includes

business to consumer (B2C) relationships, best exemplified by the car-sharing business as ShareNow, Emov and Wible, in which companies own (frequently electric) cars, that are shared and rented by the users on a minute basis, being able to park them freely in a delimited area and thus avoiding high costs of access and maintenance of the vehicles. Naturally, the collaborative economy also encompasses consumer to consumer (C2C) relationships, like those offered by Relendo, a platform that allows individuals to rent out idle goods (such as cameras or household appliances) to other individuals that may need them occasionally. Last but not least, the collaborative economy also includes peer to peer (P2P) relationships, being this the case of Couchsurfing, a platform that allows travellers to stay with local hosts worldwide, motivated by the cultural exchange and with no economic transaction.

In the travel and tourism industry, the collaborative economy has found fertile ground for its expansion and popularization. In recent years, this phenomenon has gained popularity among locals and travellers alike. From the local community perspective, the chance to generate an extra household income by sharing one's home or second residence was seized. For the travellers, this was perceived as an opportunity to travel more authentically by staying in a real home instead of a hotel room, and many argue, more budget-friendly. The rise of the collaborative economy in the lodging sector is notable:

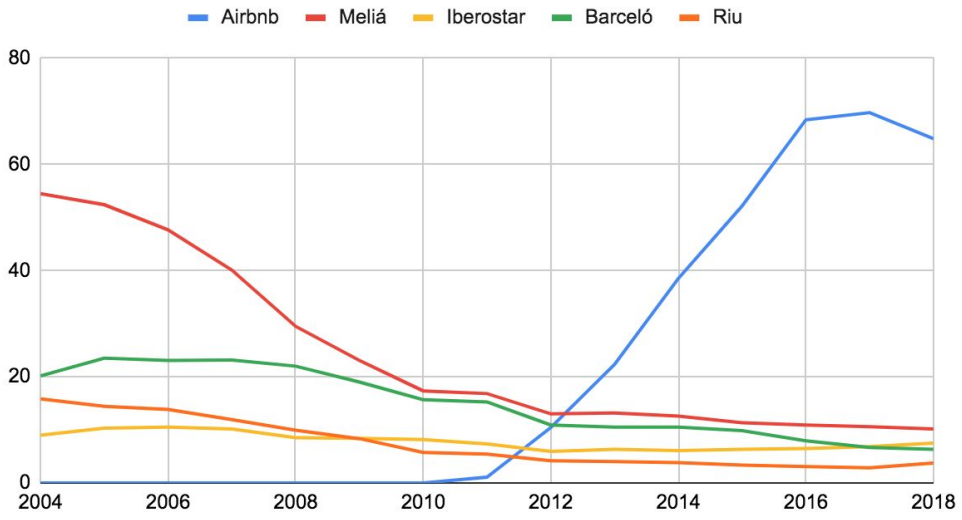

Figure 1.1: Interest in Spain towards hospitality brands over time

Source: Own elaboration with data from Google Trends

Although Airbnb is without a doubt the most widespread collaborative economy platform in the tourism industry and frequently merited the innovation, it is not alone changing the rules of this traditional industry. Annexe I provides a list of collaborative economy platforms that either compete with the leader in the same market segment or offer a different concept within the collaborative economy. Notwithstanding, leading the collaborative economy in hospitality, Airbnb is often referred as the most representative company for understanding the implications of this phenomenon, and is, for this reason, considered as the parameter of reference in analyzing the effects this sector has had over the tourism industry.

One of the most fascinating aspects of the collaborative economy is the coexistence of opposed positions on its regard, both in the public opinion and in academic literature. Advocates for the collaborative economy tend to highlight the resource optimization factor (Szetela and Mentel, 2016) and the possibility of sharing instead of possessing as an alternative to an ecological transition (Gansky, 2010; Leismann et al, 2013). The collaborative economy is seen by this group of authors as part of a transition facing a new economy (Chase, 2015) and as a possibility to move towards more conscious capitalism (O'Toole and Vogel, 2011). In this position, some authors emphasize that the collaborative economy creates an opportunity for cities to use technology for solidarity, sustainability and justice (McLaren and Agyeman, 2015). It is seen as a tool to reduce waste and avoid unnecessary consumption (Demailly and Novel, 2014) with a singular role in advancing society towards sustainability (Voytenko Palgan et al, 2017). Last, it is considered to represent a social advancement within capitalism but including post-capitalism aspects (Kostakis and Bauwens, 2014). On the opposite front, a great part of the literature on the collaborative economy highlights the risk these companies generate by operating freely in an otherwise protected market, such as labour (Slee, 2015) and denounce that the so-called ecological benefits might be overestimated (Barnes and Mattsson, 2016) since the individual economical benefit would still prevail over the ecological one (Böcker and Meelen, 2017). In line with this, several authors highlight that the ecological and social visions find a detriment over consumerism (Belk, 2014; Martin, 2016) and as such, the collaborative economy goodwill manifesto, in reality, conceals nothing less than neoliberalism on steroids (Murillo et al, 2017) with a few monopolistic digital platform companies controlling and profiting in most transactions (Gössling and Hall, 2018). One of the main concerns regarding the

collaborative economy rests on the travel and tourism industry players (such as Airbnb, HomeAway and FlipKey), that are causing housing rental prices to increase and therefore induce a tourism-gentrification, displacing neighbours in favour of higher-paying tourists (Paccoud, 2016; Haar, 2018; Cocola-Gant and Gago, 2019; Rodríguez-Pérez de Arenaza et al, 2019) and negatively impacting employment in the low-end hotels replaced by collaborative economy dwellings (Fang et al, 2016).

In the travel and tourism industry, in which this research attempts to provide insight, the opposed perspectives over the collaborative economy could not be an exception. There is conflicting evidence regarding the effect that these activities have over this otherwise traditional industry. Evidence in favour suggests that the collaborative economy does not compete with the hotel industry, basing these conclusions on the finding that they aim a different market segment (Mody et al, 2017). This view is reinforced by an analysis conducted by STR (2017), a renown hotel industry consulting firm, which has provided evidence that the hotel industry business has continued its growth unaffected after the emergence of these disruptive players in the market. On the other hand, one of the most cited publications on the impacts of the collaborative economy estimates the profit loss of the hotel industry around the 8% to 10% (Zervas et al, 2017). Surprisingly enough, although there is literature on the impact of collaborative economies in the hotel industry, its impact in the tourism industry as a whole, normally measured in tourist flows, has not been looked into.

Nevertheless, there has been previous research on the impact that other great innovations of our days have had over the tourism industry, such as the creation of the eurozone and the emergence of low-cost carriers in the aviation industry. First, Gil, Llorca and Martínez (2006) have provided evidence on the effect that the European Monetary Union has had on tourist flows. Through an econometric analysis applying a gravity model covering from 1995 to 2002, their research shows that the adoption of the euro represented an increase of the 6,3% in incoming tourist flows to eurozone countries. These authors have applied four panel-data models to test their hypothesis, including a dichotomous variable to represent the adoption of the euro as a national currency in each country. Regarding the second innovation mentioned, Rey, Myro and Galera (2010) have analysed the impact of the emergence of low-cost carriers product of the deregulation of the airline markets. By means of a dynamic panel data model

and delimiting their study to Spain, but analyzing the effect in each Autonomous Community, their findings reveal that this innovation has had significant and positive direct and indirect effects on the tourism demand in Spain. These authors do also represent the robustness of their model by presenting six different estimations employing alternative estimators, such as the fixed-effects Arellano-Bond estimator, a random-effects generalized least squares estimator and the Balestra model, including in some additional instruments. Tourism contribution to the growth of economies has long been studied in literature and has indubitably positioned itself as a driver of economic growth in many regions, such as Latin America (Eugenio-Martin et al, 2004), Europe (Brida et al, 2008) and Asia (Lee and Chang, 2008). The specific case of tourism contribution to the Spanish economy has also been analysed, positioning Spain's trajectory as a success case study of tourism contribution to economic growth (Ivanov and Webster, 2007; Cortes-Jimenez and Pulina, 2010).

It is in this context that the present research expects to make a contribution, providing insight into the impact of the collaborative economy in incoming tourist flows to Spain. For this reason, it is of great relevance to understanding the change in travel patterns that the collaborative economy has fostered. Previous research on this topic (Tussyadiah and Pesonen, 2016) has identified an increase in travel frequency and in the length of stays of travellers abroad product of the price reduction in hospitality services. It was also identified that travellers are searching for a more authentic experience, and staying in real apartments as locals do, greatly contributes to the realness of the trip. Additionally, the contact with local hosts enhances this experience and provides opportunities to engage in more authentic interactions. Last, this research also highlights that the cost reduction allows travellers to reach destinations that were previously cost-prohibitive. This study is complemented by the survey conducted to 800 tourists that had used Airbnb in the past year, which concluded that travellers were motivated by practical benefits more than the experiential characteristic of the collaborative economy, such as the money-saving and the home benefits, like access to a kitchen, location in non-hotel covered areas or a private setting (Guttentag et al, 2018).

As a result of this behavioural change of the demand, seeking more authentic experiences and willing to travel more often, and the reduction in costs of travel that the collaborative economy implies, this innovation in services could boost travellers flows internationally,

resulting in enduring growth for worldwide economies. This research, therefore, expects to make a contribution to academic literature in the understanding of this phenomenon and identifying the impact that the collaborative economy has had on the tourism industry as a whole, as well as contribute to the comprehension of the place innovation takes on reshaping the travel sector. The following section aims to provide a framework for this analysis and design a model for the travel demand that may estimate the impact of the collaborative economy in tourism.

3. Methodology

Aiming to unveil whether the emergence of the collaborative economy in tourism, as a disruptive business model innovation alternative to the traditional lodging industry, indeed fosters the incoming international tourist flows and therefore promotes the economic growth of countries (Gahli, 1976), this research applies a statistical inference methodology.

To answer the research question, a tourism demand model has been built. Herein, a structural break is expected to occur as a product of the innovation promoted by the collaborative economy. This demand model is analyzed in panel data. The particularity of this panel data is that it employs different countries, but in their tourist emission towards one specific economy. Therefore, the cross-section feature is provided by the countries of origin of the tourist flows, and the time series component ranges from 2006, previously to the emergence of the collaborative economy, up to the most recent available data of 2019. In this model the series are stationary. Dickey-Fuller tests for the root unit have been conducted for each country and are available in Annexe II.

In order to reduce the autocorrelation natural to the model, different considerations have been made. First, the data has been transformed from the gross values to quarterly interannual change rates. Additionally, this bias is contained by using lags of the dependant variable as instruments for the lagged dependent variable. The models are presented with 1 and 4 lags. The justification for the choice of said lags is included in Annexe III, in which a partial autocorrelation analysis has been conducted by the means of conventional techniques. This research presents eight different models. On one hand, two dynamic panel-data estimations, each with 1 and 4 lags respectively. On the other, two random-effects Generalized Least Squares regressions, also with 1 and 4 lags respectively. Each of these four models are estimated twice, first on the test for a structural break, and secondly, including a variable specific to the collaborative economy.

When defining the country to be analyzed, by virtue of the size of its economy, the digitalization of its society and the proximity to outbound tourism markets, Spain represents an excellent sample to delimit this analysis. Tourism represents to Spain 16% of its exports and is only behind France as the leading tourist destination in the world measured by tourist arrivals[1].

In order to conduct the analysis, and define the countries to be selected for the research, Spanish inbound tourism markets must be taken under consideration:

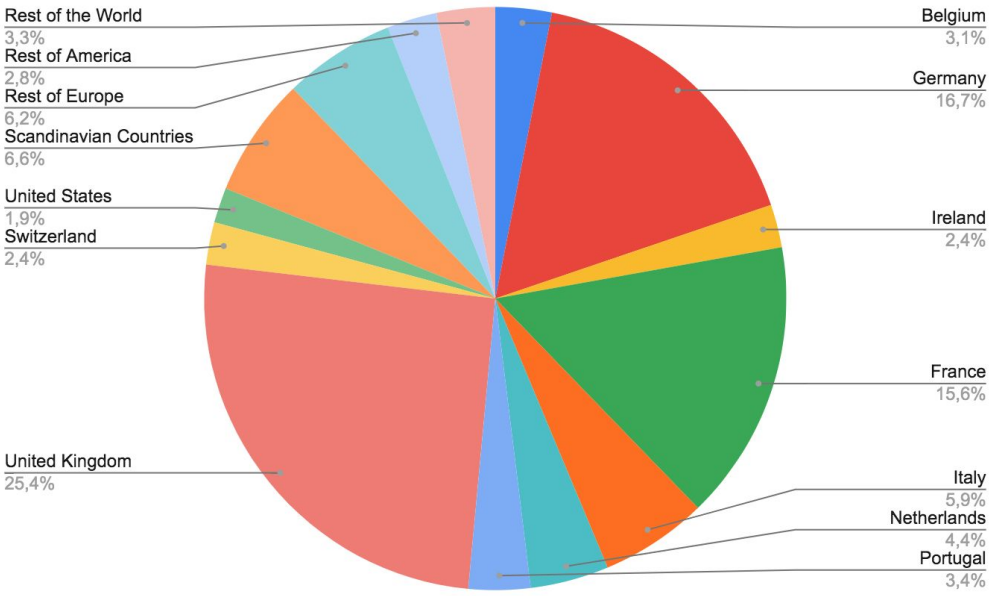

Figure 3.1: Spanish Inbound Tourism Markets from 2005 to 2015

Source: Own elaboration with data from Frontur

As can be observed from the precedent figure, the United Kingdom, Germany and France are the main inbound tourism markets for Spain. Together with the following 7 countries, Italy, Netherlands, Portugal, Belgium, Ireland, Switzerland and the United States, these top 10 countries represent 81,1% of the total incoming tourists to Spain. For this reason, these countries are considered to represent a sufficient explanation of the tourism demand for Spain.

[1] According to the World Tourism Organization 2018 Country Profile for inbound tourism, available on https://www.unwto.org/country-profile-inbound-tourism

Framework

In explaining international tourism flows, the most widespread framework are gravity models. Paralleling the Newtonian gravity theory, these models explain that the attraction of two countries depends directly on the mass of the economy and inversely on the distance, or price of travel, between them (Song et al, 2009). For this reason, the demand function of tourism in destination *i* by residents of country *j* is given by:

$$Q_{ij} = f(Y_j ; R_{ij} ; P_j ; D_{ij} ; \varepsilon_{ij})$$

Here, Q is the amount of tourism demand, measurable by incoming tourists to the destination *i* proceeding from country *j*. Y represents the size of the economy of country *j*. R is the real exchange rate between country *i* and country *j*. P is the population of origin country *j*. D is the distance between country *i* and country *j*. Last, ε is the disturbance term that captures all other factors that may affect the tourist flows from country *j* to country *i*.

Data

In order to build the model that explains the research question, many sources of data were analyzed for each variable. Following are the most important clarifications on data and data sources chosen:

Dependent Variable

International tourism demand is normally measured either in tourist flows or in matters of international tourists expenditure. This last measurement could be problematic to the terms of this research since the income generated by the tourist consumers of collaborative economy properties is hardly accounted for in statistics. This is due to the fact that the payment made by the tourist is collected by foreign digital platforms (such as Airbnb, Homeaway, etc) and directly transferred to the host shortly after the tourist arrival. For this reason, and although it

would certainly be interesting to have insight on the effect of the collaborative economy in tourists expenditure and its direct spillover to the hosting ecosystem, the dependant variable considered by this research is that of international tourist arrivals. This data is provided by Spain's National Institute of Statistics (Instituto Nacional de Estadísticas) and the Ministry of Industry, Commerce and Tourism (Ministerio de Industria, Comercio y Turismo) through the Frontur analysis, that captures the movement of tourist in the Spanish international borders.

In gross terms, the international tourist arrivals variables, as depicted below, has an autocorrelation pattern that shall be avoided:

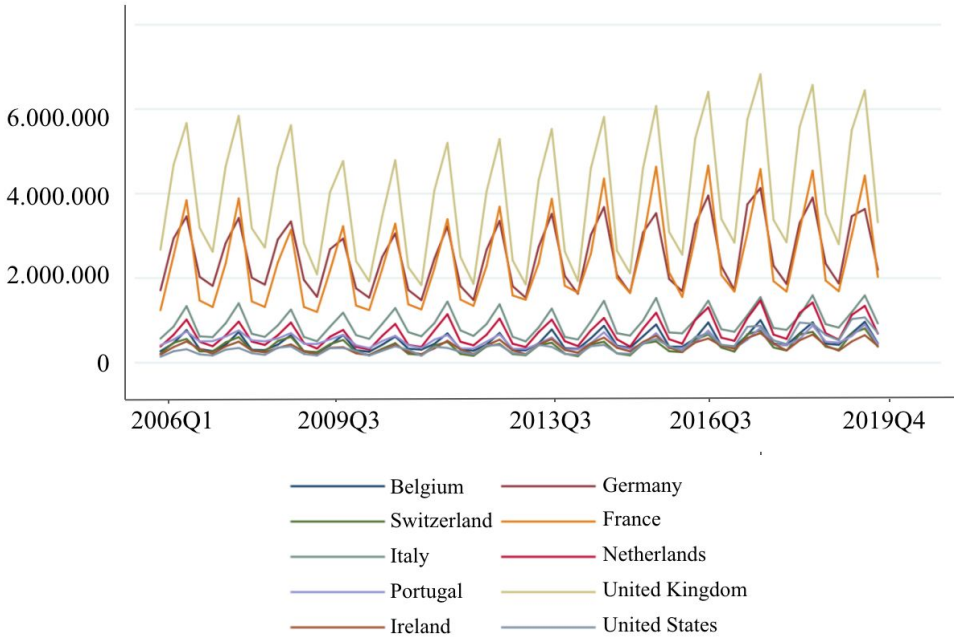

Figure 3.2: International Tourist Arrivals - Gross terms

Source: Own elaboration with data from Frontur

For this reason, the dependant variable employed in this analysis is that of the difference of the logarithms from the observed quarter and the same quarter in the previous year. Therefore, the dependant variable analyzed is the quarterly interannual change rate.

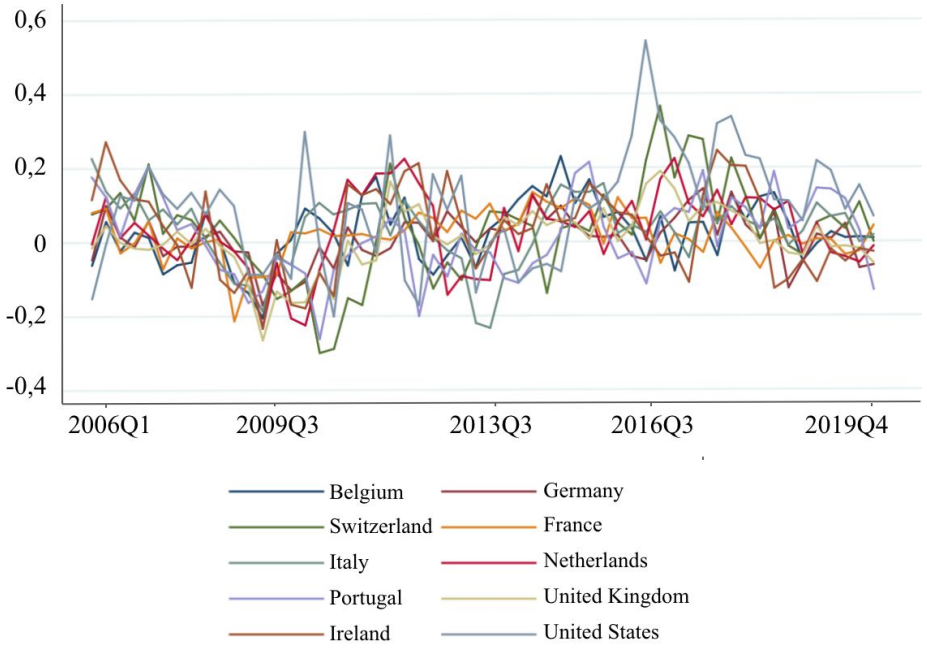

Figure 3.2: International Tourist Arrivals - Quarterly interannual change rate

Source: Own elaboration with data from Frontur

The dependant variable in quarterly interannual change rate, as exhibited, does not have the previously observed gross variable autocorrelation problems.

Explanatory Variables

In pursuance of analyzing the change of the tourism demand, and understanding the effect of the collaborative economy in this pattern, the following explanatory variables will be considered:

Income

The income of the country of origin is frequently considered the key explanatory variable in tourism demand models. This can be considered in two forms. If only leisure tourism is considered, then personal disposable income is recommended to be employed. However, since the collaborative economy in tourism also serves business travels, the more general

income variable of the GDP is a better variable to be employed. This variable was built using OECD Quarterly National Accounts data, specifically the Gross Domestic Product per head, in 2015 United States dollars at constant prices in Purchasing Power Parity.

Population

It seems to require no explanation that, *ceteris paribus*, the greater the population of a country, the greater the amount it's of tourists. Therefore, this variable could not be obviated and is included in many tourism econometric analyses. The population for the selected countries was obtained through the OECD demographic database, which registers quarterly data for this indicator.

Real Exchange Rate

The real exchange rate between the country of origin (*j*) and the destination country, Spain (*i*) is also a variable that affects the tourism flows. The real exchange rate was obtained by the following procedure:

$$RER = \frac{ER_j}{ER_i} \div \frac{CPI_j}{CPI_i}$$

Both the exchange rate and the consumer price index were obtained from the Eurostat's database. While the exchange rate considered as the average of the quarter, the consumer price index employed was quarterly provided, harmonized base 100 in 2015.

Distance

Part of the gravity model, the distance between the country of origin (*j*) and Spain, the destination country (*i*), must be a part of the equation. The data on the distance between countries is obtained through the European Commission Distance Calculator. The air distance data is provided in kilometres and considered from capital city to capital city.

Collaborative Economy

As previously stated, although collaborative economy platforms have long existed and, furthermore, travellers have always had the possibility to stay in private dwellings while visiting destinations in which they had family or friends, this lodging alternative had always been marginal, until the business model innovation developed by Airbnb in early 2008. For the first years of operation, the platform and its imitators had a small niche of the market, but since 2012, its market has grown consistently, outgrowing that of traditional industry players as Meliá Hotels, Barceló Hotel Group, Riu Hotels & Resorts and Iberostar Hotels & Resorts. For this reason, the collaborative economy's significant emergence shall be considered with a dichotomous variable represented by 0s until the fourth quarter of 2011, and 1s from 2012 onwards. However, since the collaborative economy emergence occurred in the same period of time as the economic crisis recovery, this variable could not be as representative as intended of the phenomenon. For this reason, a second explanatory variable is included.

The second explanatory variable for the purpose of this topic is the interest in the collaborative economy in the countries of origin. This is obtained through the Google Trend tool, that provides insight on the interest of a specific market in the platform. This tool assigns a value of 100 to the month in which the term of search was most popular, and the respective percentages to the other months in comparison with the latter. This tracks the interest in the collaborative economy in tourism in the countries of origin, which allows in time, to corroborate the existence of a correlation between said interest in the collaborative economy and the tourist flows to the destination country. As elaborated previously on this paper, since Airbnb is the undisputed leader of the collaborative economy in the hospitality industry, this company will be considered as the reference for the interest in the collaborative economy by residents of the country of origin. This variable is particularly attractive to the effect of this research since the interest in the collaborative economy in the countries of origin is further from circularity problems that often arise in tourism demand models. Additionally, the interest in the collaborative economy does not necessarily mean that the tourist indeed used collaborative platforms, since the price reduction in other hospitality services could result in the tourist indeed travelling towards the destination, but staying in a traditional hospitality product instead. The final data on where the tourist finally stayed is less

relevant for this research since what is being explained is the international tourist arrivals, independently if they stayed at a hotel or in a collaborative economy dwelling.

It must be noted that there was a third explanatory variable considered to represent the collaborative economy phenomenon, which was the officially collected data on the use of apartments by tourists visiting Spain. This data is available in the Frontur survey published by Spain's National Institute of Statistics (Instituto Nacional de Estadísticas) and the Ministry of Industry, Commerce and Tourism (Ministerio de Industria, Comercio y Turismo). However, this variable was dropped for various reasons. First, a methodological change occurred in 2015 that directly impacts the information needed for this analysis. Second, the use of apartments as a hospitality service is not exclusive for the collaborative economy, and could therefore be misleading. Third, since the information provided by the Frontur survey is that of the use of hospitality services, the analysis would have had critical circularity problems when contrasting it towards international tourist flows.

Econometric Model

Following Garín-Muñoz (2004, 2005, 2006), Rey et al (2010) and Gil-Pareja et al (2007), the model takes into consideration the key explanatory variables of tourism demand (Song et al, 2009), and incorporates the variables to explain the effect of the collaborative economy in tourism demand flows:

$$ITA_{ij,t} = \alpha \; GDPpc_{j,t}^{\beta 1} \; POP_{j,t}^{\beta 2} \; RER_{j,t}^{\beta 3} \; DIS_{j}^{\beta 4} \; CEbreak_{i,t}^{\beta 5} \; CEtrend_{j,t}^{\beta 6} \; \mu_{ij} \; \varepsilon_{ij,t}$$

Here, *i*, *j* and *t* represent the cross-section and time-series observations. ITA is the number of international tourist arrivals from country *j* to country *i*. GDP is the real GDP per capita in country *j*. POP is the population of country *j*. RER is the real exchange rate in country *j* towards that of country *i*. DIS is the distance between country *i* and country *j*, measured in kilometres. CEbreak is the dummy variable for the emergence of the collaborative economy in country *i* that shall denote the structural break in the model. CEtrend is the variable

denoting the interest in the collaborative economy in countries of origin *j*. Next, μ in a month fixed term to capture the effect of external factors that affect the dependant variable. Last, ε is the error term.

As frequently happens in tourism analysis, the aforementioned variables have a circular relationship, as the international tourism flows impacts on GDP, this last also impacting on the use of the collaborative economy, and vice versa. This calls for the instrumentation of the Arellano-Bond estimator that avoids circularity by explaining the dependant variable also by its past data. Since the Arellano-Bond estimator is a fixed-effects model, the variables that are constant in time cannot be included. Therefore, and since its effect is already captured in the fixed effect term, the distance variable shall be omitted from these models. In the random effects regressions, the aforementioned lags shall be considered to reduce the autocorrelation.

After the logarithmic transformation, the final form of the estimation model is:

$$ln\,ITA_{ij,t} = \alpha + \beta 1\, ln\,GDPpc_{j,t} + \beta 2\, ln\,POP_{j,t} + \beta 3\, ln\,RER_{j,t} + \beta 4\, ln\,DIS_{j}$$

$$+ \beta 5\, CEbreak_{i,t} + \beta 6\, ln\,CEtrend_{j,t} + \mu_{ij} + \varepsilon_{ij,t}$$

The parameters of interest to the effect of this research are $\beta 5$ and $\beta 6$. If the collaborative economy indeed stimulates the international tourism flows, the coefficients $\beta 5$ and $\beta 6$ should be positive and of statistical significance.

4. Results

The following variables are included in the analysis, each in quarterly interannual change rate, except for the distance variable, which is naturally constant, and the dichotomous variable for the structural break:

Variable	Mean
xlnita	Quarterly interannual change rate for international tourist arrivals from origin countries to Spain
xlngdppc	Quarterly interannual change rate for GDP per capita of origin countries
xlnrer	Quarterly interannual change rate for the real exchange rate for origin countries to Spain
xlnpop	Quarterly interannual change rate for the population of origin countries
lndis	Logarithm for the distance between origin countries and Spain
cebreak	Structural break dummy
xlncetrend	Quarterly interannual change rate for CE trend in origin countries

Table 4.1: Variables description

Variable	Mean	Standard Deviation	Observations
xlnita	0.0297366	0.1057893	560
xlngdppc	0.0098913	0.0299082	560
xlnrer	-0.0026001	.0469732	560
xlnpop	0.0054309	0.0051346	560
lndis	7.255517	0.5842245	560
cebreak	0.5714286	0.4953141	560
xlncetrend	0.3015745	0.3589946	560

Table 4.2: Descriptive statistics

Below are the results for the estimation of the two dynamic panel-data models, and the two random-effects GLS regressions. Table 4.3 provides the results for the four models including the variable for the structural break. Table 4.4 depicts the results replacing this dichotomous variable with the more accurate variable for the interest in the Collaborative Economy in countries of origin.

Variable	(1)	(2)	(3)	(4)
L1	.4835979 (0.000)	.4307602 (0.000)	.5007683 (0.000)	.4434348 (0.000)
L2		.1265718 (0.002)		.1338318 (0.002)
L3		.1386179 (0.010)		.1476324 (0.010)
L4		-.2460329 (0.000)		-.2368593 (0.000)
xgdppc	.6302781 (0.006)	.5310338 (0.010)	.5723624 (0.013)	.4382609 (0.022)
xrer	-.16428 (0.056)	-.1577006 (0.025)	-.1603468 (0.036)	-.1789593 (0.009)
xpop	1.868354 (0.000)	2.155829 (0.000)	.5514791 (0.316)	.729081 (0.146)
lndis			.0162859 (0.012)	.0153014 (0.005)
break	.0187496 (0.007)	.0242573 (0.000)	.0129409 (0.034)	.0202139 (0.000)
_cons	-.0127798 (0.017)	.0174351 (0.011)	-.1203969 (0.011)	-.1187762 (0.002)
Wald Test	2973.71 (0.0000)	6304.93 (0.0000)	13271.72 (0.0000)	352022.14 (0.0000)
Observations	540	510	550	520
Groups	10	10	10	10
Obs. per group	54	51	55	52

(1) Arellano-Bond dynamic panel-data estimation - 1 lag

(2) Arellano-Bond dynamic panel-data estimation - 4 lags.

(3) Random-effects GLS regression - 1 lag

(4) Random-effects GLS regression - 4 lags

Notes: Coefficient for each value is provided, together with its p-value between parenthesis. The dependant variable is International Tourist Arrival quarterly interannual change rate. The regressions include GDP per capita, real exchange rate and population all in quarterly interannual change rate product of the difference between the logarithm with the same quarter in the previous year, as well as distance and a dummy for the emergence of the Collaborative Economy. The distance variable is excluded from (1) and (2) regressions since its effect is already captured in the countries fixed-effect term and its inclusion would cause perfect collinearity.

Table 4.3: Results for Structural Break

Variable	(1)	(2)	(3)	(4)
L1	.4898191 (0.000)	.4333254 (0.000)	.5043485 (0.000)	.4447623 (0.000)
L2		.1307681 (0.000)		.1367754 (0.000)
L3		.1468595 (0.010)		.153888 (0.010)
L4		-.2260698 (0.000)		-.2206747 (0.000)
xgdppc	.6689899 (0.006)	.5766099 (0.007)	.5983328 (0.013)	.4820703 (0.016)
xrer	-.1520481 (0.010)	-.1637932 (0.001)	-.146012 (0.005)	-.1795556 (0.001)
xpop	1.678689 (0.015)	1.654245 (0.039)	.4824236 (0.449)	.496741 (0.462)
lndis			.0160647 (0.017)	.0145842 (0.007)
xlncetrend	.0253687 (0.011)	.0239603 (0.022)	.0202287 (0.056)	.0210723 (0.044)
_cons	-.0091633 (0.302)	-.0091129 (0.336)	-.1174199 (0.010)	-.1079454 (0.002)
Wald Test	815.16 (0.0000)	85277.72 (0.0000)	1816.70 (0.0000)	5.84e+06 (0.0000)
Observations	540	510	550	520
Groups	10	10	10	10
Obs. per group	54	51	55	52

(1) Arellano-Bond dynamic panel-data estimation - 1 lag

(2) Arellano-Bond dynamic panel-data estimation - 4 lags.

(3) Random-effects GLS regression - 1 lag

(4) Random-effects GLS regression - 4 lags

Notes: Coefficient for each value is provided, together with its p-value between parenthesis. The dependant variable is International Tourist Arrival quarterly interannual change rate. The regressions include GDP per capita, real exchange rate and population all in quarterly interannual change rate product of the difference between the logarithm with the same quarter in the previous year, as well as distance and the quarterly interannual change rate for the interest in the Collaborative Economy. The distance variable is excluded from (1) and (2) regressions since its effect is already captured in the countries fixed-effect term and its inclusion would cause perfect collinearity.

Table 4.4: Results for Interest in the Collaborative Economy

5. Discussion

As can be interpreted from the precedent results, all variables are significant and have the expected signs. The Wald test presents all eight models to have significant explanatory variables. In all eight models estimated, as expected, the GDP per capita of the countries of origin serves as the major explanatory variable to the international tourist arrivals to Spain. The largest the growth of the GDP per capita in the countries of origin, the largest the number of outgoing tourists they have. Although the first models, the Arellano-Bond dynamic panel-data estimations, presents the highest coefficient for this variable, all estimations present positive and significant estimates for this variable. The coefficient of the real exchange rate variable indicates that, when Spain becomes a more expensive destination and the real exchange rates grows, tourism to the country tends to decrease, although its impact is considerably smaller than that of the GDP per capita. The expected result was a negative sign, and all estimations provide said result, with a negative and significant coefficient in the range of -0,146 to -0,179. Regarding the population in the country of origin, the results are positive as expected, and, except for the third estimation, the random-effects GLS regression with 1 lag, all estimations present a significant value for the coefficient of this variable. The distance variable, naturally invariable in the time series, was deliberately excluded from the dynamic data-panel models since its effect was already included in the fixed-effect term, and its inclusion would cause perfect collinearity. The random-effect regressions accept the inclusion of this variable, essential as described earlier in gravity models, and its estimation is positive and of statistical significance. To the effect of this research, however, the most relevant variables are those for the Collaborative Economy innovation. This was analyzed through two different variables. First, a dichotomous variable for the innovation of the collaborative economy. As can be noted in the results, in all four different models ranging from dynamic data-panel models to random effects estimations, both with one and four lags, the coefficient for the structural break variable for the collaborative economy is positive and of statistical significance. This provides evidence of a structural change in the tourism demand model in Spain product of the innovation generated by the collaborative economy in hospitality. However, since the emergence of the Collaborative Economy occurred in the

same period of time as the economic crisis recovery, and although this effect is partially captured in the GDP per capita variable, the dichotomous variable could not be capturing the collaborative economy phenomenon as representatively as needed. For this reason, a much more specific second variable for the collaborative economy is included, representing the interest for this sector in the countries of origin. In this case, all coefficients are again positive and of statistical significance, resulting in the confirmation that the collaborative economy has indeed had a positive effect in the international tourist arrivals to Spain.

To further interpret the result, since the dependant variable had undergone a logarithmic transformation, the coefficients for the collaborative economy structural break and trend require the application of exponentials to obtain the estimated impact of this variable in the international tourist arrivals. In this way, the original dependant variable xlnita was the product of:

$$ln\,(ITA_{t}) - ln\,(ITA_{t-4}) = ln\,(\frac{ITA_{t}}{ITA_{t-4}})$$

To eliminate the neperian logarithm and purely obtain the ratio of change that the collaborative economy has had over the international tourist arrivals, the exponential of the coefficient is in place:

cebreak	Coefficient	Exponential
(1)	0.0187496	1.0189265
(2)	0.0242573	1.0245539
(3)	0.0129409	1.013025
(4)	0.0202139	1.0204196

Table 5.1: Coefficient interpretation for cebreak

xlncetrend	Coefficient	Exponential
(1)	0.0253687	1.0256932
(2)	0.0239603	1.0242497
(3)	0.0202287	1.0204347
(4)	0.0210723	1.0212959

Table 5.2: Coefficient interpretation for xlncetrend

This way, the coefficient exponentials explain the growth rate of the quarter *t* over quarter *t-4* (quarterly interannual change) that the introduction of the collaborative economy has had on the dependant variable, the international tourist arrivals. This growth rate varies over the different models but is expected to be in the range from a significant 1,30% to a 2,56%.

This work naturally has different limitations that could be addressed in future work. First, although the results are robust, there might be other unobserved factors that might have an effect on the dependant variable. Additionally, despite its clarity, the structural break dichotomous variable does have limitations which are intended to be solved by the interest variable, but an officially collected specific data for the demand or interest in the collaborative economy could be an interesting contribution to the conduction of this analysis. On another point, there is a part of the dwellings in collaborative economy platforms that are purely buy-to-let investments and should therefore not be regarded as part of the collaborative economy. However, by analyzing the business model innovation, its impact in the international tourist flows is still represented by this study. Last, this research is limited to the tourism demand for Spain, and although its results are expected to be able to be extrapolated to similar countries, other characteristics such as the geographical proximity to strong economies might call for this study to be repeated for other countries.

The results obtained by the means of the eight different econometric models show robust evidence that the collaborative economy has had a positive and significant impact on the international tourist arrivals in the range of 1,30% to 2,56%.

6. Conclusion

The collaborative economy emergence has indubitably, although to different extents, disrupted the course of many industries worldwide. It has also presented an alternative for individuals to generate a complimentary household income, while at the same time co-creating value in their communities and promoting more conscious production and consumption practices. Nonetheless, it is not exempt from negative externalities, such as market deregulation, labour precarization and touristification. In the tourism industry, the collaborative economy is frequently depicted as a threatening change agent that absorbs market share by the means of unfair competition methods.

Different contributions to academic literature have deepened on the collaborative economy impact in the hotel industry, providing conflicting statements on the matter. However, limited evidence on the impact of the collaborative economy on the tourism industry as a whole has been found. The present research aspires to fill this gap by providing insight into the change in the tourism demand equation product of the innovation spawned by the collaborative economy. Although the collaborative economy might have had a negative impact in the hotel industry, it seemed likely that, because of the price reduction on hospitality services, both by offering a more economical lodging product than hotels and by increasing competition, as well as by increasing the receptive capacities of destinations and by seizing the changing tastes of the demand, the collaborative economy might have, in reality, fostered the international tourist flows and cherished economic growth. To test this hypothesis, a demand gravity model has been built and analyzed through several data-panel models. By contrasting different estimators and models, ranging from fixed-effects dynamic data-panel models to generalized least squares data panels, the effect of the collaborative economy in the tourism industry has been analyzed.

The results for such estimations in all eight models provide a significant and positive coefficient for the impact of the collaborative economy variable. The interpretation of the results is that the collaborative economy is responsible for the growth rate on the international

tourist arrivals to Spain in the range of a significant 1,30% to 2,56%. Such growth rate is far from negligible, especially in an economy as the Spanish, in which the tourism industry is a core gear in the economic engine, and particularly in times of great economic uncertainty as the pandemic present, in which the collaborative economy earnings and its immediate spillover to household incomes certainly provides a much-needed relief to the society.

These results implicate that the collaborative economy phenomenon must not be ignored nor demonized and, in line with the European Union agenda for the collaborative economy (European Commission, 2016), its innovation must be embraced. Furthermore, policymakers should foster the collaboration of local authorities and communities with collaborative economy platforms so as to co-create the still immature normative system, keeping as a first priority the customer and employment protection while also enhancing the employment creating capability of the collaborative economy. This policy must be complemented with a harmonization of the divergent normative system that may be found in a local scale, hopefully to a transnational level, that may generate the necessary confidence in the collaborative economy that both customers, communities and entrepreneurs require. Last, it is necessary that the collaborative economy regulatory system prevents it from becoming a submerged economy and contributes in capitalizing its positive externalities.

This paper could be complemented by further research that might provide a better understanding of the collaborative economy phenomenon. First, research on the impact of the collaborative economy on other countries in different regions could represent a great contribution to confirm the findings of the present research. Additionally, it would be interesting to analyze the impact of the collaborative economy users expenditure and its spillover effect in the hosting ecosystem.

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8. Annexes

Annexe I: Collaborative platforms in the hospitality sector

Following are the main companies operating in the collaborative economy of the hospitality sector:

- Airbnb: Founded in 2008 in San Francisco, this company is one of the signatures of the collaborative economy. It prides on over 7 million listings and 500 million check ins since its creation.[2]
- HomeAway: As the most direct competitor of Airbnb, the HomeAway group emcompasses many nieche collaborative economy platforms. This platform has a selection of more than 1 million properties[3] shared in its sites. HomeAway was acquired by Expedia Group in 2015.
- CouchSurfing: This community offers the possibility to connect travelers with locals that are willing to host them for free, being the cultural exchange or international social interaction the main interest. Couchsurfing has 400.000 yearly active hosts[4].
- FlipKey: This company started as a vacation rental platform but soon moved towards the collaborative economy. Today, as part of Tripadvisor Rentals, FlipKey lists 300.000 properties ranging from private rooms to boats[5].
- OneFineStay: A niche collaborative economy platform acquired by Accor in 2018, OneFineStay targets high-end properties, and has a rigorous procedure to list a dwelling that includes an on-site inspection of the property. This platform lists 5.000 properties to early 2020[6].

[2] https://news.airbnb.com/fast-facts/ accessed on April 9th 2020.
[3] https://www.homeaway.com/info/about-the-family/ on April 9th 2020.
[4] https://www.couchsurfing.com/about/about-us/ on April 9th 2020.
[5] https://www.flipkey.com/pages/about_us/ on April 9th 2020.
[6] https://www.onefinestay.com/about/ and https://www.travelweekly.com/Travel-News/Hotel-News/Accor-committed-growing-Onefinestay-homesharing-business on April 9th 2020.

- HomeStay: This company, founded in 2013, specializes in shared dwellings, excluding the possibility to rent whole properties, since its focus is on the local sharing experience. To this date, HomeStay has 55.000 members[7] sharing their homes through the platform.

Apart from the aforementioned companies, there are many other platforms and communities that serve the collaborative economy in tourism, such as TrustedHousesitters, a platform aimed at pet-sitting, or WarmShowers, a hospitality network exclusively for bikers.

[7] https://www.homestay.com/about-us on April 9th 2020.

Annexe II: Dickey-Fuller Test

In analyzing the international tourist flows in a time period it is of extreme relevance to have certainty that the time series feature of the data panel is stationary and the series is stable through the observed time units. This implies the stability for the mean, variance and the covariance structure through the period. In order to conduct further analysis, it is expected that the series are stationary.

The Dickey-Fuller test provides an excellent method to assess this. In this test, the null hypothesis is that there is a unit root, meaning that the series is not stationary.

Although the Dickey-Fuller is specific to time series and does not accept panel-data, each country has been analyzed separately, therefore accepting this test, results for which are provided below:

Country	Test Statistic	P-value for Z(t)	Observations
BE	-4.399	0.0003	55
CH	-4.589	0.0001	55
DE	-3.304	0.0147	55
FR	-4.431	0.0003	55
IE	-3.407	0.0107	55
IT	-3.576	0.0062	55
NE	-3.850	0.0024	55
PT	-3.016	0.0334	55
UK	-4.002	0.0014	55
US	-4.803	0.0001	55

Table 8.1: Dickey-Fuller test

As can be observed from the precedent table, in all countries analyzed it is possible to accept the hypothesis that the series is stationary.

Annexe III: Partial Autocorrelation analysis

When choosing how many lags to employ in order to conduct the estimations a partial autocorrelation analysis has been executed. In this way, the analysis shows how much correlation there is with the previous lags of the dependant variable.

As observed below, in every partial autocorrelation analysis for each of the ten countries analyzed, the first lag is always out of the confidence interval and significantly distinct from zero. Therefore, there is a lag of one quarter that must be considered in the model. Additionally, many countries present significance in the fourth lag. This is logic since the fourth lag represents the same quarter in the previous year.

For this reason, the analyzed models shall include one and four lags.

Belgium

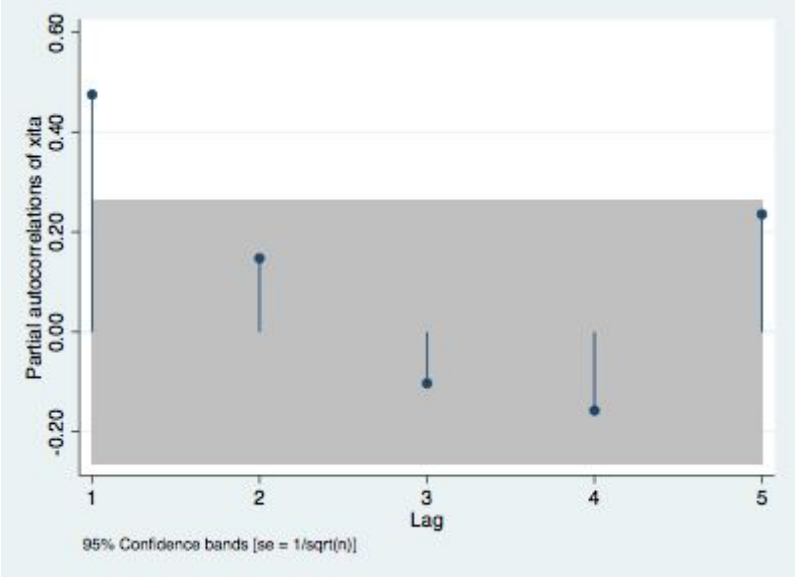

Figure 8.1: Belgium Partial Autocorrelation analysis

Switzerland

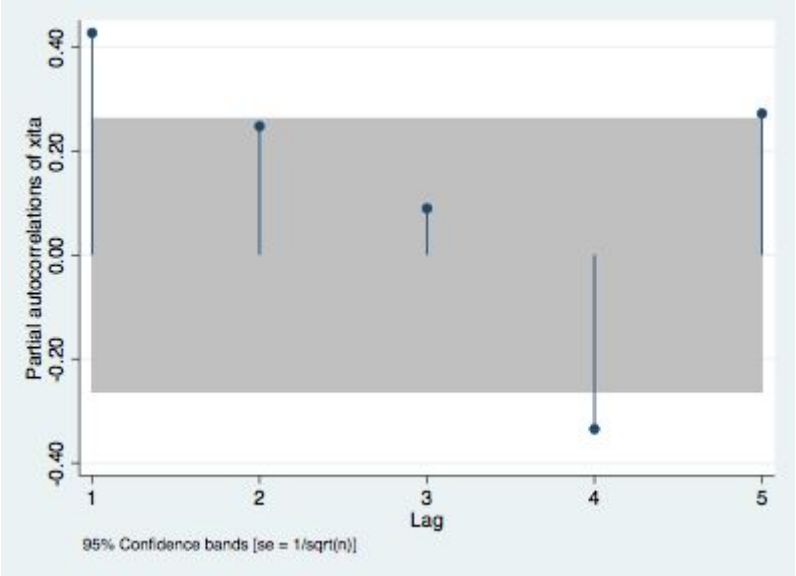

Figure 8.2: Switzerland Partial Autocorrelation analysis

Germany

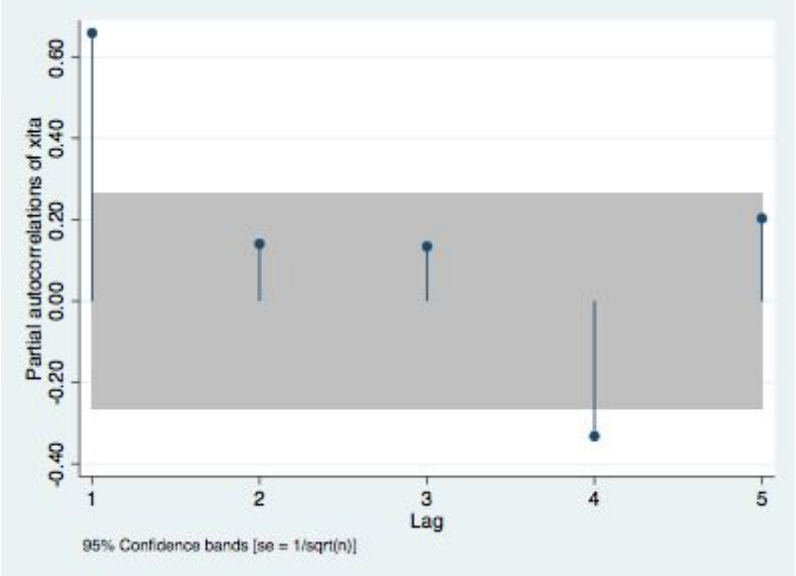

Figure 8.3: Germany Partial Autocorrelation analysis

France

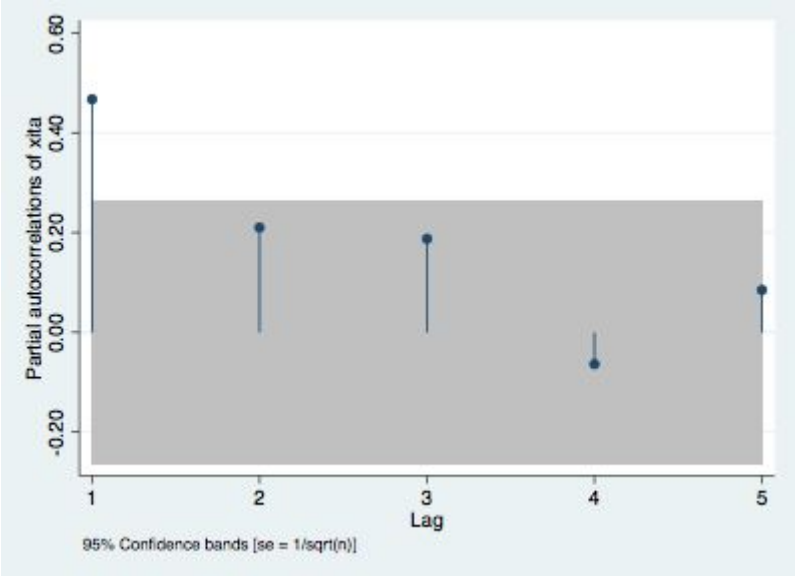

Figure 8.4: France Partial Autocorrelation analysis

Ireland

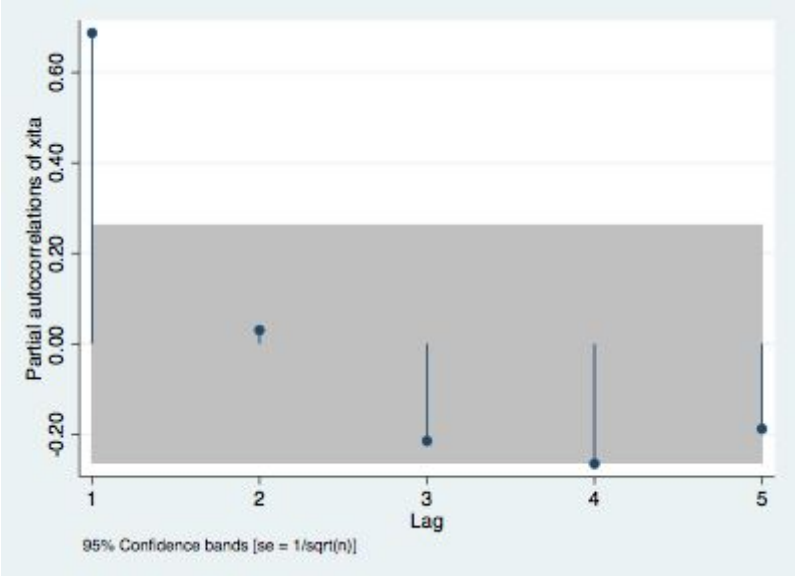

Figure 8.5: Ireland Partial Autocorrelation analysis

Italy

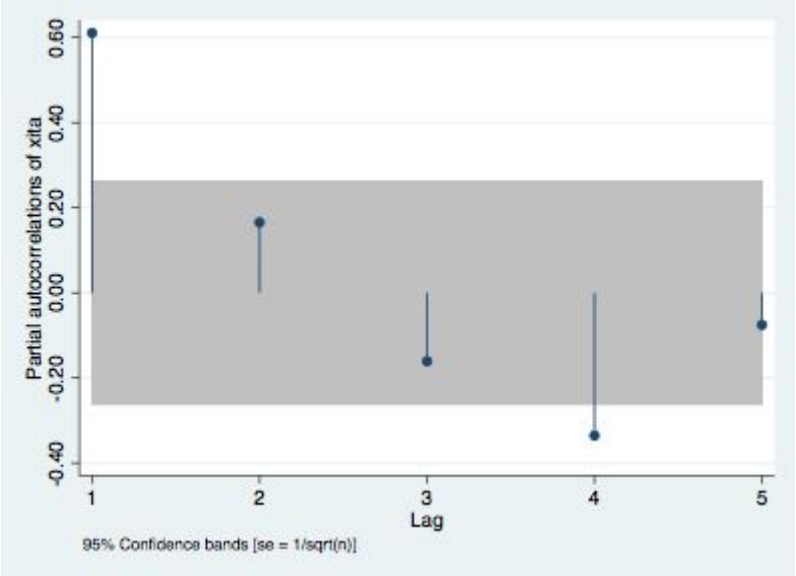

Figure 8.6: Italy Partial Autocorrelation analysis

Netherlands

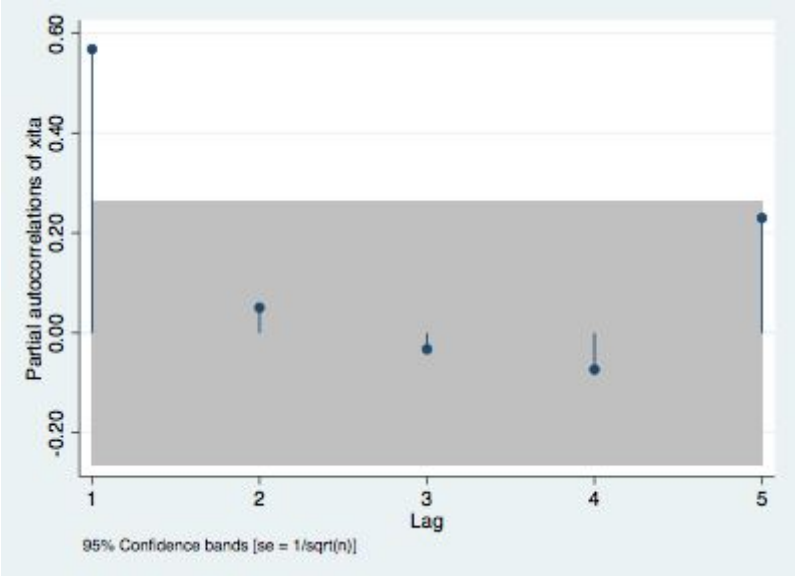

Figure 8.7: Netherlands Partial Autocorrelation analysis

Portugal

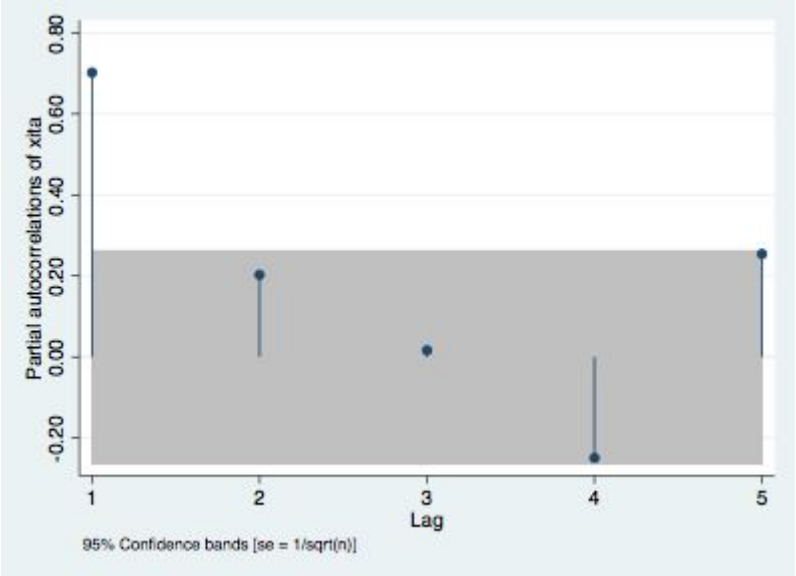

Figure 8.8: Portugal Partial Autocorrelation analysis

United Kingdom

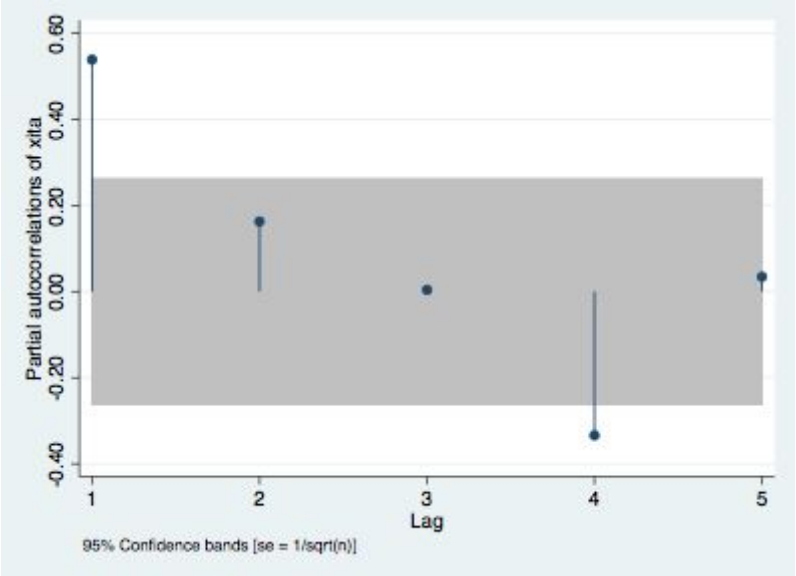

Figure 8.9: United Kingdom Partial Autocorrelation analysis

United States

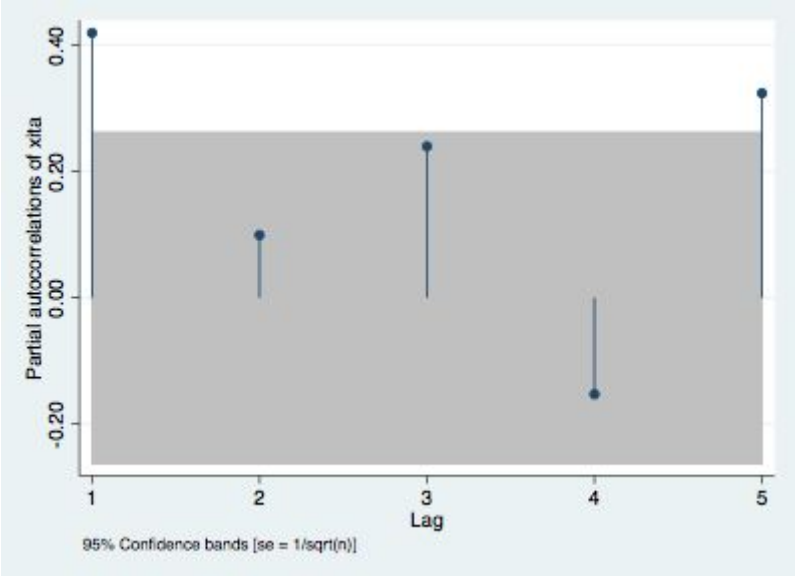

Figure 8.10: United States Partial Autocorrelation analysis