« Grotwth Cause Tourism Developement? Exploring Some Granger Causality Direction »

by

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EXPLORING SOME GRANGER CAUSALITY DIRECTION »

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Abstract

This paper analyze how the income shocks in the 9 countries with major tourism flows to Spain affects on the Spanish tourism inbound for the period 2000-2016. To this end, we apply a range of alternative econometric approaches in order to evaluate the robustness of our findings. In particular, we start by applying the Toda and Yamamoto (1995) and Hatemi-J. (2012) for a Granger causality analysis from a time series perspective and, for the country-by-country analysis, the methodolgy proposed by Emirmahmutoglu and Kose´s (2011), as an extension of Toda and Yamamoto (1995). Empirical results suggest that the impact of GDP in the origin countries on Spanish tourism inbound is heterogeneous and country-specific and an asymetric behaviour appear among countries. The analysis of this issue can be relevant for the design and implementation of specific tourism promotion programs by policymakers and practitioners in order to apply it by each origin countries.

JEL classification: L83, F43; C32..

Key words: Tourism; Economic growth; Granger causality, asymmetric causality; panel causality; bootstrap.

Resumen

Este trabajo analiza el efecto de los shocks en el GDP de los 9 países europeos con mayors flujos de turistas hacia España en la llegada de estos turistas a nuestro país.. Para ello se aplican las aproximaciones de Toda and Yamamoto (1995) y Hatemi-J. (2012) para un análisis de causalidad de Granger y para un análisis de países se usa la aporximación propuesta por Emirmahmutoglu y Kose´s (2011). Los resultados sostienen que el impacto de los shocks en el GDP es heterogéneo y presenta además un comportamiento asimétrico, lo que nos permite establecer políticas específicas de turismo para cada país.

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1. Introduction

The relationship between economic development and tourism has focused the interest of policy makers, researchers and academiscs due to Tourism's contribution to world GDP debate. For the fifth consecutive year in 2015 tourism rising for nearly 10% of world GDP (US$7.6 trillion), furthermore the sector now supports nearly 277 million people in employment – that's 1 in 11 jobs on the planet (see World Travel and Tourism Council-WTTC, 2016). This growing interest emerge in developed countries, where the growing trend in international tourism flows were interrupted in late 2008 by the effects of the international financial crisis and even though from 2010 international tourist flows regained their vigor, intensity of growth differ between geographical areas (Gómez and González, 2015). In Spain, following the report of Cuenta Satélite del Turismo, the share of tourism (receiver) in the whole of the Spanish economy has increased in recent years, being the third largest tourist destination and with a higher relative weight on GDP 6%, which represents a remarkable importance of tourism in the balance of payments, allowing the correction of the external imbalance of the Spanish economy in recent years.

Despite there are many studies analyzing the relationship between tourism and growth, specially focusing the study on the relationship in bidirectional terms (see among others Balaguer and Cantavella-Jordá, 2002; Gunduz and Hatemi-J., 2005), the impact of tourism on countries development is the fact widely held in the literature on tourism, in the so called Tourism-Led growth hipothesis (TLG). However fewer studies have addressed the relationship in the opposite direction, that is GDP growth causing increase on tourists arrivals, even when most studies have used the Granger Causality technique that allow prove the relation in both directions (see recently for instance Pavlic et al., 2015; Liangju et al., 2012; Caglayan et al., 2012; or Tang and Abosedra, 2013).

For this reason, our goal in this paper is analyze the effect of GDP shocks in the 9 countries from which Spain receives more tourists on the Spanish tourism inbounds. To this end, we investigate a sample of 9 OECD countries from the period 2000-2016, using the real GDP and the international tourist arrivals collected from OECD database and Instituto Nacional de Estadística (INE). Our empirical approach applied consist in a set of techniques developed by Toda and Yamamoto (1995) and Hatemi-J. (2012) for a Granger causality analysis in a time series perspective and, for the country-by-country analysis, the methodology proposed by Emirmahmutoglu and Kose´s (2011), as an extension of Toda and Yamamoto (1995) in a panel data aproximation. To the best of our knowledge, this may will be the first application of these econometric techniques in the field of the relationship between tourism and economic growth. We reveal that exist a relationship between grotwh and tourism flows in several ways accross the countries analyzed and thus, showing the importance of the economics idiosyncrasy. Our paper contributes to the previous literature in two ways, firstly our interest in this work is to know how the income shocks in the 9 countries with major tourism flows to Spain affects on the Spanish tourism inbound and, secondly, identify the existence of assymetries in this relationships. In particular, this paper aims to study how affects the state of the economy of the origin country on the tourists inbounds in Spain and, above all, to discriminate this behavior by country and by economic situation in order to establish a particular country's tourism policies.

The plan of this paper is structured as follows. Section 2 presents the theoretical and empirical background on growth and tourism relationship. Section 3 describes the data and methods used in the empirical analysis. Section 4 presents the main results, and section 5 discusses implications for academics and policy makers.

2. Theoretical background

The identification of the determinants of tourism demand are central to any effort to understand and explain changes in tourism demand. In this sense, many variables have generally been examined and accepted in previous research, however, significant distinctions can be drawn between the influences of different determinants for different visit purposes (see Peng et al., 2015). Some of these determinants that plays a key role in the tourist inflows are the relative price of tourism, quality service (Albadejo et al., 2014), the volume of international trades, the transportation costs, the size of the population within the origin (Turner and Witt 2001); trends in immigration patterns (Seetaram and Dwyer 2009); destination promotional expenditure, (Crouch et al. 1992); changes in tourists' tastes; seasonal variations (Lim 2004); climate change (Lise and Tol 2002); political instability (Dhariwal 2005; Naude and Saayman 2005); foreign direct investment (Tang et al., 2007); unemployment rates (Cho, 2001); income distribution (Morley 1998); quality or security perceptions (Tang and Abosedra, 2013; Albandejo et al., 2014 or Pavlic, 2015) or the educational level of tourists and their age distribution (Alegre and Pou, 2004).

Apart from this interest that researchers have to know the conditions of demand, it has also been studied the effects that tourism has on the economics development. For instance trough competition, economies of scale, import capital goods (Balaguer and Cantavella-Jordà, 2002), through the multiplier effect with linked industries, since human capital because tourism activity has the ability to create new jobs, economic benefits and income for the economic agents in the local economy or can also stimulate investment in new infrastructure and competition, create economies of scale and allow for diffusion of technical knowledge (see the survey of Brida *et al.*, 2016).

Although there is a very large literature has explored the relationship in both directions, attention has been placed mainly in the sense of knowing the effect that tourism demand has on economic growth. The belief that international tourism can promote economic growth is known as the TLG hypothesis, inspired by the idea that tourism brings in foreign currencies which can be used to import capital goods and services, favoring economic growth (McKinnon, 1964). In order to explain the growth rate of output over long periods one is usually referred to a couple of complementary approaches (see Balaguer and Cantavella-Jordá, 2002). One is growth theory, which models the interactions among factor supplies, productivity growth, saving, and investment in the process of growth, supported if unidirectional causality is found from tourism to economic growth and, consequently policies aimed at subsidising tourism will have a positive impact on economic growth. The other is growth accounting, which attempts to quantify the contribution of different determinants of output growth.

However Tugcu (2014) propose several directions concerning the relationship between GDP and Tourism, recognizing a bidirectionallity of the tourism and growth relationship. Firstly, he propose that the initial conditions determine the effect caused by tourism on growth, being relatively bigger in the economies that have worse initial conditions than the economies with better ones. Other reason supported in his work can be attributed to the interconnections among the sectors, so it is expected that the more tourism develops, the more the others produce and the faster an economy grows and vice versa. So, it is possible to summarize the TLG hypothesis under different point of views (see Tugcu, 2014 where summarize this alternatives approaches to TLG). Recently, Hatemi (2016) or Gabriel Brida (2016) analyze the direction proposed by TLG hypothesis concerning this relationship showing that the TLG hypothesis can be supported empirically. Firstly, the *feedback hypothesis* denotes a reciprocal relationship between tourism and growth, so tourism conservation policies may decrease economic growth performance, and similarly, chances of economic growth are reflected back to the tourism sector. The second one is denoted as *neutrality hypothesis*, sostained by the idea that tourism has no effect on economic growth.[1] Also, the *conservation hypothesis* means that economic growth is the dynamic that strengthens the tourism sector. The validity of the conservation hypothesis is supported if there is unidirectional causality from economic growth to tourism. In this situation, transferring subsidies from tourism to another sector will not have a negative impact on economic growth.

Some of the stylised facts we have presented allow us to understand the process that generates growth mainly from tourism. The mainstream in this literature have considered that tourists arrive in the host country at a given exogenous rate, which is a parameter that is independent of the country's characteristics (Albandejo et al. 2014). By contrast, in Albaladejo and Martínez-García (2013) endogenize the rate at which tourists arrive. This is

[1] In order to distinguish the growth, feedbak, neutrality and conservation hypothesis, Tugcu (2014) summarize the empirical studies concerning to support each hypothesis.

important in the idea to analyze the growth procces of tourism and economy as exogenous or endogenous, so the number of tourists inflows increases by increments of income in the origin countries while this tourism is generating higher incomes. Supporting this endogenous point of view, Tugcu (2014) argue that in the absence of economic growth, the development of the tourism sector diminishes. In this sense, it can be anticipated that the causality between tourism and economic growth is from tourism to growth in the countries with established tourist attractions, whereas it is from growth to tourism in the countries having the material ones. Finally, he propose that the economic growth itself may play a vital role in determining the direction of causality between tourism and economic growth, conditionated to an adequate economic structure in terms of income distribution.

In this attempt to proove the causality between economic growth and tourism demand, Liangju et al. (2012) show that China's economic growth is the Granger cause of development of domestic tourism as well. For its part, Canova and Dallari (2013) presented some conclusions that allow us to understand the effect of output shocks on fluctuations in tourism flows in the Euro area. Their analysis also reveal that the link is obscured if unconditional correlations are considered and the predictable part of the fluctuations is not filtered out of the data. In addition, they show that the reaction of tourism flows to income shocks is much stronger in recessions than in expansions. They argue that fostering the tourist relationships may help to integrate faster Mediterranean economies with the EU and may have long lasting beneficial output effects because of the virtuous investment cycle they ignite.

Adittionally, the total per-capita expenditures of families, as a proxie of the propensity of consume, have to increase their consumption influences on the tourism products, especially knowing that this demand is a luxury good. The luxury good characteristics of international tourist flows is supported by Canova and Dallari (2013), and also as is indicated by the fact that most studies have estimated a high income elasticity of demand (see Crouch, 1996), which shows that, as income rises, tourism consumers spend an increasing proportion of their income on international travel (Peng et al., 2015). In this sense, under the influence of different economic conditions and cultural and customer habits, the income and price sensitivities of tourists from different origins would be expected to vary (Peng et al., 2015).

The wealth of the empirical studies just described has been derived from researches focused on the mentioned causality relationship between tourism and economic growth (Ivanov and Webster, 2013), emerging in the literature to check the relationship such us Balaguer and Cantavella-Jordá, (2002) or Albandejo et al., (2014) for Spain; Gunduz and Hatemi-J. (2005) for Turkey; Katircioglu (2009) for Cyprus; Dritsakis (2004) for Greece; Oh (2005) for South Korea; Durbarry (2004) for Mauritis; Mishra et al. (2012) or Brida et al., (2008) for Mexico, applying in most cases the approximation of cointegration and Granger causality test with time series data (Balaguer and Cantavella-Jordá, 2002; Dritsakis, 2004; Durbarry, 2004; Oh, 2005; Nowaket al., 2007; Carrera et al., 2008 or Brida et al., 2010 or recently Wu *et al*., 2016).[2] According to Po and Huang (2008), since time series data have some inefficiency in reflecting the long-run relationship between tourism and economic growth, an alternative strand of the literature is composed of studies that analyse the relationship between tourism and economic growth by using cross-section or panel data. In this context, they indicate that there can be mixed results on the relationship between tourism and economic growth that are sensitive to the specific country group being examined.

Although many studies finding a positive relationship between tourism and economic growth (Cortés-Jiménez and Pulina, 2010; Gunduz and Hatemi-J, 2005; Dritsakis 2004; Nowak et al., 2007), some studies have failed to show such link (see Sequeira and Campos, 2005; Oh, 2005; Lee, 2008; Kim et al., 2006 or Katircioglu, 2009). Perhaps, one of the most striking in the extense evidence that tests the causality between tourism and growth is the work of Hatemi-J. (2014), where is sostained that while economic growth is great for growth in the tourism sector in four of the G7 countries observed, none of them should have policy that is aimed at improving economic growth through tourism. On the other hand, also support that tourism shocks, negative or positive, have a greater impact on economic performance and which of the GDP shocks have a greater impact on tourism activity for each country. In his work show that there is a causal relationship between tourism activity and economic growth, with GDP actively causing tourism activity for Canada, Germany, France, Italy and Japan. Particularly, Canada and Germany are the only two countries where a symmetric causal relationship is found. For its part, Aslan (2013) concluded that while there is bidirectional causal nexus between tourism development and economic growth for Portugal, unidirectional causal nexus from economic growth to tourism development is found for Spain, Italy, Tunisia, Cyprus, Croatia, Bulgaria and Greece.

This line of arguments present an ambiguety framework due to the fact that the state of the literature is inconclusive, either because not the direction of causality is unclear, the most suitable for analysis technique, samples or the time period studied. In this work, to shed more light on this relationship, we carry out a novel empirical approach in which we want to test how imply the economic situation on the spanish tourism inbounds, in other words, how affects the economic shocks in each origin country, possitives and negatives, on the tourism inbound to Spain.

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[2] See table 1 for a selected review of different research papers on Tourism literature clasiffied by methodology, data and growth and tourism measures used after 2009.

3. Data and Methodology

3.1 Data

In this paper we analyze the nature of the relationship between the GDP of Belgium, France, Germany, Italy, Netherlands, Portugal, Switzerland, U.K. and USA with the tourism inbounds in Spain. This countries represents the 9 economies from which Spain receives more tourists for the period 2000-2016. Several proxies can be used when the objective is analyze the tourism inflows and growth (see Gunduz and Hatemi, 2005).[3] Although these indicators has been widely used by many authors within the field of the TLG application, the volumen of tourists arrivals presents the advantage of not being monetary measures, thus helping to avoid any casual multicolinearity issue. For its part, to prove the relationship between tourism and economic development, the empirical approaches found in the literature frequently include in the estimates the real GDP as an indicator for the economic growth. We use in our empirical approach the tourst arrivals by country of origin and has been obtained from the INE, while the GDP data is obtained from the OECD expressed in millions of 2010 US dollars. Both time series have quarterly periodicity seasonally adjusted and are available from 2000QI to 2016QII.

[3] In this regard Table 1 summarize the main measures of tourims and also shows that the key measures of growth is GDP.

Table 1: Selected papers on the TLG hypothesis after 2009

Study	*Publication Year*	Country or countries	Period	Measure of growth	Measure of tourism	Data	Methodology	Main result
Ozturk & Acaravci	*2009*	Turkey	1987-2007 (Quarterly)	real GDP, 1987=100),	International tourists (NT), the real tourism receipts (TR, 1987=100) and the real exchange rates (RER, 1987=100).	Central Bank of the Turkish Republic (http://www.tcmb. gov.tr)	Vector error correction model (VEC) and an autoregressive distributed lag model (ARDL).	TLG hypothesis cannot be inferred for the Turkish economy because no cointegration exists between international tourism and the real GDP. Moreover, Granger causality test and error correction model cannot be run any further in the long-term period.
Katircioglu	*2009*	Turkey	1960–2006.	real GDP (natural logarithm) where the GDP variable is at 2000 constant	Total number of international tourists visiting and accommodating in Turkey and real exchange rates.	World Bank Development Indicators (World Bank, 2006) and Turkish Institute of Statistics (TURKSTAT, 2007). US dollar prices.	Bounds test and the Johansen technique for cointegration- (ADF, PP,ARDL)	TLG hypothesis cannot be inferred for Turkey since both the bounds and the Johansen tests do not confirm long-term equilibrium relationship between international tourism and economic growth. Thus, unlike Gunduz and Hatemi-J (2005) and Ongan and Demiroz (2005), this study rejects the validity of the TLG hypothesis for Turkey.
Tang & Jang	*2009*	U.S.A.	1981-2005 (Quarter 1, 1981 to Quarter 4, 2005)	GDP	Aggregate industry sales revenue	COMPUSTAT	Cointegration and Granger causality tests.	No cointegration between economic growth and industry performance in the U.S. This suggests that mechanisms to increase the revenue of tourism related industries can potentially be successful in the long-run, even in the face of sustained economic stagnation. The results also indicate a temporal causal hierarchy among industry performance, which could be a good tool for timing and prioritizing the allocation of resources among industries to ensure better overall tourism and economic outcomes.
Savas et al.	*2010*	Turkey	1985:Q1-2008:Q3. &	Real GDP (*Yt*)	Real tourist expenditures (*TOURt*) and international tourist arrivals (*NTOURt*) and real exchange rates	Turkish Statistical Institute; and *Tourism Statistics (2000-2008)* of The Ministry of Culture and Tourism of Turkey- *The Central Bank of the Republic of Turkey- OECD.-The*	ARDL	find evidence of long-run uni-directional causality running from the volume of international tourism (both the tourist expenditures and tourist arrivals) and real exchange rates to economic growth, but not vice versa. The results indicate that the Turkish case supports the tourism-led growth hypothesis.

Study	*Publication Year*	Country or countries	Period	Measure of growth	Measure of tourism	Data	Methodology	Main result
			1984:Q1-2008:Q3.		(*RERt*).	*Central Bank of the Republic of Turkey*'s		
Mishra et al.	*2012*	India	1978 - 2009	Real Gross Domestic Product	Tourism Foreign Exchange Earnings (TFEE) and Foreign Tourist Arrivals (FTA)	RBI database on Indian economy, Bureau of Immigration, and from tourism statistics published by Ministry of Tourism, Government of India.	Augmented Dickey-Fuller Unit Root Test ; Johansen's Cointegration Test; Estimates for VECM Regression; Granger Causality Test	Evidence of long-run unidirectional causality from tourism activities to economic growth of the country.
Caglayan et al.	*2012*	135 countries	1995-2008	GDP	Real tourism revenue (receipts). Real tourism revenue (LTR) is used to measure tourism development and expressed in natural logarithms.	World Bank database; World Development Indicators and Global Developments Finance)	Panel Granger causality analysis	Results indicated bidirectional causality in Europe between tourism revenue (TR) and gross domestic product (GDP). Findings showed that there is a unidirectional causality in America, Latin America & Caribbean and World from GDP to tourism revenue. While in case of East Asia, South Asia and Oceania the reverse direction of causality was found from tourism revenue to GDP. No causal relationship was found in Asia, Middle East and North Africa, Central Asia and Sub Saharan Africa.
Liangju et al.	*2012*	China	1984 - 2009	GDP	China's domestic tourist arrivals	The Yearbook of China Statistics and The Yearbook of China Tourism Statistics.	Panel Granger causality analysis	China's economic growth is the Granger cause of development of domestic tourism as well.
Tang and Abosedra	*2013*	Malaysia	1974 - 2009	GDP	Real tourism receipts	International Financial Statistics published by the International Monetary Fund, the World Deve-lopment Indicators reported by World Bank and the CEIC database.	Panel Granger causality analysis	The results reveal that a long-run relationship exists between the variables. In the short run, this study finds no Granger causality between real tourism receipts and real income, whereas there is bidirectional causality in the long-run. Moreover, we also find unidirectional causality running from real exchange rates to real tourism receipts and real income in

Study	Publication Year	Country or countries	Period	Measure of growth	Measure of tourism	Data	Methodology	Main result
								both short- and long-run.
Albadejo et al.	*2014*	Spain	1970- 2010	GDP	Number of tourists (Tt), ratio of luxury hotels and the total number of hotels in Spain (Qt), and foreign real GDP (Mt)	INE & Encuesta de Ocupación Hotelera	Three stages: unit root tests, cointegration analysis, and Granger causality tests.	in the long run, tourist arrivals, quality of tourism accommodations, and foreign GDP have a positive effect on Spanish GDP. In the short term, changes in economic growth appear to lead to growth in tourist arrivals. Our findings support a two-way causal relationship between real GDP growth and tourism growth in Spain.
Tugcu	*2014*	*European*: Albania, Bosnia and Herzegovina, Croatia, France, Greece, Italy, Malta, Monaco, Montenegro, Slovenia, Spain and Turkey. *Asian*: Cyprus, Israel, Lebanon and Syria. *African*: Algeria, Egypt, Libya, Morocco and Tunisia.	1998-2011	GDP pc growth-annual	International tourism receipts (RCPT) in current US$ and international tourism expenditures (EXP) in current US$	World Bank, World Development Indicators database and World Tourism Organization, Compendium of Tourism Statistics.	1) Panel unit root tests (Levin, Lin, and Chu, 2002, and Im, Pesaran, and Shin, 2003, 2) Cross-sectional Dependency (Pesaran, 2004) 3) Granger causality test (Dumitrescu and Hurlin, 2012).	The results indicate that the direction of causality between tourism and economic growth depends on the country group and tourism indicator. Furthermore, the European countries are better able to generate growth from tourism in the Mediterranean region.
Hatemi-J	*2014*	G7: Italy, Canada, Japan, France, the UK, the US and Germany.	1995-2012	GDP	Real international tourism receipts	World Bank's World Development Index	Asymmetric panel causality test suggested by Hatemi-J (2011)	The results show that exist a positive economic shocks cause positive tourism shocks for Canada, France, Italy and Japan. A bidirectional relationship is found only for Germany and there is a causal relationship between tourism activity and economic growth, with GDP actively causing tourism activity for Canada, Germany, France, Italy and Japan. In this case, Canada and Germany are the only two countries where a symmetric causal

Study	*Publication Year*	**Country or countries**	**Period**	**Measure of growth**	**Measure of tourism**	**Data**	**Methodology**	**Main result**
								relationship is found. More importantly, the results further show that tourism activity causes GDP growth for Germany, France, Italy and US. Germany, France, and the US, however, are the only three countries where a symmetric causal relationship is found. Further, one could conclude that the TLGH is not valid for G-7 countries given that positive tourism activity shocks do not lead to positive economic output shocks for any of the countries.
Pavliv et al.	*2015*	Croatia	1996q1–2013q2	GDP	Tourist arrivals	Croatian Bureau of Statistics	Johansen Maximum Likelihood cointegration	Short-run causality between OPEN and GDP, as well as between real effective exchange rate and GDP.
Pérez-Rodríguez et al.	*2015*	U.K., Spain & Croatia	U.K. 1980Q1-2012Q2 (n=130); Spain 1995Q1 2013Q1(n=73); Croatian 1997Q1-2013Q4 (n=68)	Gross Domestic Product (GDP) data from 2005 with constant prices (Y1t)	Tourist receipts	IMF while tourism receipt data were collected from International Passenger Survey (Office for National Statistics) for the United Kingdom, from Boletín Estadístico del Banco de España for Spain and from the Croatian National Bank for Croatia.	copula-based GARCH approach	Results indicate that there is a significant, asymmetric and positive dependence between tourism and GDP growth rates for the three countries studied, though only for Croatia is it time-varying over time.
Mérida et al.	*2016*	Spain	1980 - 2013 (Q)	GDP	Number of nights spent in Spanish tourist accommodations	The number of nights spent is expressed in thousands of units and has been obtained from the INE4. The source of the GDP data is the OECD and REMSDB	Granger Causality Tests & Structural Test	Causality from economic growth towards tourist activity is found until 1994, when the relationship changes its direction. Results also confirm bidirectional causality from 1999 onwards, thus contributing to reconcile previous results.

Study	*Publication Year*	**Country or countries**	**Period**	**Measure of growth**	**Measure of tourism**	**Data**	**Methodology**	**Main result**
Wu et al.	*2016*	Tourism receipts in the Asian and Australia (Australia, China, Hong Kong, Indonesia, Japan, South Korea, Macao SAR, Malaysia, Singapore, and Thailand).	1995–2013	GDPit denotes the real per capita gross domestic product	TOURit denotes the real per capita international tourism receipts. ai	World Bank (2015)	A panel smooth transition vector error correction model (PST- VECM)	Empirical results support that the causality is bi-directional, nonlinear, time- and country-varying in both the long run and short run.

3.2. Methodology

The aim of our empirical strategy is to determinate the possible existence of Granger causality relationships (Granger, 1969) between the origin tourists GDP and Tourism inbounds, using a set of econometric techniques in order to obtain more robust and comparable results. On the one hand, we apply the appoach proposed by Emirmahmutoglu and Kose´s (2011) for a panel analysis in order to understand the behavior all the countries studied arises. On the other hand we use the method proposed by Toda and Yamamoto (1995) and extended by and Hatemi-J (2012) for assymetries analysis which allow us to analyse the country-specific heterogeneity. Both techniques are an extension of Toda and Yamamoto (1995) does not require us to test previously the existence of unit root or cointegration for panel data, that is, the variables in the system do not need to be stationary and can be used in level form.

3.2.1. Granger causality, by country: Toda-Yamamoto test.

In economics, perhaps the most common techniques of examining the causality effects between variables is using Granger causality method based on the estimation of VAR models and more specifically in tourism´s topics. The methodology proposed by Toda and Yamamoto (1995) tries to measure causality in order to solve the problems stemming from cointegration relationship and non-stationarity of the data series. For a wide study about our relationship proposed, we propose the Toda-Yamamoto causality approach as an developed version of the Granger causality test based on augmented-VAR models in levels and extra lags which is a more efficient and robust results than the standard VAR model due to it can lead to biased results, in particular, with finite samples – see, Johansen and Juselius, (1990); Zapata and Rambaldi (1997), Maddala and Kim (1998); Pesaran et al., (2001) and Clarke and Mirza (2006)–. The main advantage of the Toda-Yamamoto test is that it can be applied irrespective of the order of integration or whether the time series are or not cointegrated (Booth and Ciner, 2005). In our exercise, a bivariate model including the origin GDP and the Spanish tourism inbounds variables under analysis, we can describe the benchmark model for this test as follow:

$$GDP_t = \alpha_1 + \sum_{i=1}^{h+d_{max}} \beta_{1i}\, GDP_{t-i} + \sum_{j=1}^{l+d_{max}} \gamma_{1j}\, Tourism_{t-j} + \varepsilon_{1t}$$

$$Tourism_t = \alpha_2 + \sum_{i=1}^{h+d_{max}} \beta_{2i}\, Tourism_{t-i} + \sum_{j=1}^{l+d_{max}} \gamma_{2j}\, GDP_{t-j} + \varepsilon_{2t}$$

Where h and l –in general, p – are the optimal lag structure for the *VAR* model, according to the Akaike Information Criterion (AIC); k is defined as the sum of $(p + d_{max})$, where d_{max} –extra lagged explanatory variables– is the maximum order of integration for the variables considered in the model; ε_{1t} and ε_{2t}, the residual terms, are Gaussian Distributed and follow white noise processes. Hence, this test estimates a $VAR\ (k)$ model using a Modified Wald test (MWALD) which statistic is asymptotic distributed as a chi-squared with p degrees of freedom.

For testing the Granger causality between these two variables note, for the first equation, that if $\sum_{j=1}^{l} \gamma_{1j} \neq 0$ implies that $Tourism_t$ Granger causes GDP_t. Analagously, the second equation, if $\sum_{j=1}^{l} \gamma_{2j} \neq 0$ represent that GDP_tGranger causes $Tourism_t$. Consequently, rejecting both hypothesis implies that there exists bi-directional causality in the analysed relationship.

3.2.2 Granger causality analysis for panel data. Emirmahmutoglu and Kose´s (2011) test

To complete our econometric strategy we will use the panel structure of our data and use their the advantages associated to the use of panel data, take into account the unobservable heterogeneity and the cross-sectional dependency of our data. A recently developed method for causality analysis using panel data is proposed by Emirmahmutoglu and Kose´s (2011), as an extension of Toda and Yamamoto (1995) in a panel data aproximation in order to provide empirical evidence about the robustness of our results. This methodology consists en considerar the level VAR with $ly + dmax_j$ lags in heterogeneous panels as follow:

$$GDP_{1,t} = \propto_{1,1} + \sum_{i=1}^{ly_1+dmax_j} \beta_{1,1}\ ;\ iGDP_{1,t-i} + \sum_{i=1}^{lx_1+dmax_j} \gamma_{1,1}\ , Tourism + \varepsilon_{1,1,t}$$

$$GDP_{2,t} = \propto_{1,2} + \sum_{i=1}^{ly_1+dmax_j} \beta_{1,2}\ ;\ iGDP_{2,t-i} + \sum_{i=1}^{lx_1+dmax_j} \gamma_{1,2}\ ;\ iTourism_{2,t-i} + \varepsilon_{1,2,t}$$

$$\vdots$$

$$GDP_{N,t} = \propto_{1,N} + \sum_{i=1}^{ly_1+dmax_j} \beta_{1,N}\ ;\ iGDP_{N,t-i} + \sum_{i=1}^{lx_1+dmax_j} \gamma_{1,N}\ ;\ iTourism_{N,t-i} + \varepsilon_{1,N,t}$$

$$Tourism_{1,t} = \propto_{2,1} + \sum_{i=1}^{ly_1+dmax_j} \beta_{2,1}\ ;\ iTourism_{1,t-i} + \sum_{i=1}^{lx_1+dmax_j} \gamma_{2,1}\ ;\ iGDP_{1,t-i} + \varepsilon_{2,1,t}$$

$$Tourism_{2,t} = \propto_{2,2} + \sum_{i=1}^{ly_1+dmax_j} \beta_{2,2}\ ;\ iTourism_{2,t-i} + \sum_{i=1}^{lx_1+dmax_j} \gamma_{2,2}\ ;\ iGDP_{2,t-i} + \varepsilon_{2,2,t}$$

$$\vdots$$

$$Tourism_{N,t} = \propto_{2,N} + \sum_{i=1}^{ly_1+dmax_j} \beta_{2,N}\ ;\ iTourism_{N,t-i} + \sum_{i=1}^{lx_1+dmax_j} \gamma_{2,N}\ ;\ iGDP_{N,t-i} + \varepsilon_{2,N,t}$$

where $y_{1,t} = 1, \ldots, N$ refers to the real *GDP* and $yX_{1,t} = 1, \ldots, N$ denote the tourism flows. *N* repesents the number of countries *(j=1…N)* and t is he time period *(t=1…T)* and *l* is the lag lenght. The maximal order of integration in the system for each i is denoted as $dmax_j$.

In order to check for Granger causality in this equations, alternative causal relations are likely to be found for country j. There is a one-way Granger causality from x (tourism) to y (real GDP) if not all $\gamma_{1,j,i}$ are zero, but all $\beta_{2,j,i}$ are zero. On the other hand, we can prove the opposite one way Granger causality if all $\gamma_{1,j,i}$s are zero, but not all $\beta_{2,j,i}$s are zero. Finally, a two-way Granger causality can be showed between tourism and GDP if neither the $\gamma_{1,j,i}$s nor $\beta_{2,j,i}$s are zero. Emirmahmutoglu and Kose (2011) apply the Fisher (1932) statistic in heterogeneous panels aiming to test the Granger non-causality hypothesis. Fisher´s Statistic combined differents significant levels (p-values) of identical but independent tests. When the test statistics are continuous, the p-values P_i (i = 1, ..., N) are independent uniform (0,1) variables.

$$\lambda = -2 \sum_{i=1}^{n} lnp_{(i)}, i = 1 \ldots N$$

where P_i denote the p-value concerning to the Wald statistic of the i-th individual cross-section, following a chi-square distribution with 2N degrees of freedom. The test is valid only if N is fixed as $T \rightarrow \infty$. However, the limit distribution of the Fisher test statistic is no longer valid in the presence of cross correlations among the cross-sectional units. As a way to deal with such inferential difficulty in panels with cross correlations, Emirmahmutoglu and Kose (2011) apply the bootstrap methodology in their Granger causality test for cross-sectional dependent panels.

3.2.3. Looking for asymmetric causality relationships.

Attending on the empirical works, appear in many cases that causality is rejected because no nonlinear relationships are contemplated. For that, a nonlinear test developed by Hatemi-J (2012) on the initial ideas of Granger and Yoon (2002) is applied in our exercise, allowing us know out whether the cumulative positive and negative shocks can cause different impacts on the causal relationship between GDP and tourism flows. Following this strategy, we start specifying our two variables by means of a random walk model:

$$GDP_t = GD\square_{t-1} + \varepsilon_{1t} = GDP_0 + \sum_{i=1}^{t} \varepsilon_{1i}$$

and

$$Tourism_t = Tourism_{t-1} + \varepsilon_{2t} = Tourism_0 + \sum_{i=1}^{t} \varepsilon_{2i}$$

where $t = 1, 2, \dots T;$ the constants GDP_0 and $Tourism_0$ are the initial constant values, and the variables ε_{1i} and ε_{2i} are white noise disturbance terms. The shocks – positive and negative- are indified as: $\varepsilon_{1i}^{+} = \max\ (\varepsilon_{1i}, 0)$; $\varepsilon_{2i}^{+} = \max\ (\varepsilon_{2i}, 0)$; $\varepsilon_{1i}^{-} = \min\ (\varepsilon_{1i}, 0)$; $\varepsilon_{2i}^{-} = \min\ (\varepsilon_{2i}, 0)$ respectively. Grouping these terms as follow, $\varepsilon_{1i} = \varepsilon_{1i}^{+} + \varepsilon_{1i}^{-}$ and $\varepsilon_{2i} = \varepsilon_{2i}^{+} + \varepsilon_{2i}^{-}$, we can write out that:

$$GDP_t = GDP_{t-1} + \varepsilon_{1t} = GDP_0 + \sum_{i=1}^{t} \varepsilon_{1i}^{+} + \sum_{i=1}^{t} \varepsilon_{1i}^{-}$$

$$Tourism_t = Tourism_{t-1} + \varepsilon_{2t} = Tourism_0 + \sum_{i=1}^{t} \varepsilon_{2i}^{+} + \sum_{i=1}^{t} \varepsilon_{2i}^{-}$$

Therefore, positive and negative shocks can be wrote as follow:

$$GDP_t^{+} = \sum_{i=1}^{t} \varepsilon_{1i}^{+}\ ;\ GDP_t^{-} = \sum_{i=1}^{t} \varepsilon_{1i}^{-}\ ; Tourism_t^{+} = \sum_{i=1}^{t} \varepsilon_{2i}^{+}\ ; Tourism_t^{-} = \sum_{i=1}^{t} \varepsilon_{2i}^{-}.$$

Assuming that $y_t^{+} = (GDP_t^{+}, Tourism_t^{+})$, $y_t^{-} = (GDP_t^{-}, Tourism_t^{-})$, $y_t^{\pm} = (GDP_t^{+}, Tourism_{1t}^{-})$, and $y_t^{\mp} = (GDP_t^{-}, Tourism_{1\square}^{+})$, the causal relationship between the variables can be tested using vector autoregressive model, VAR of order p ¸ for lag order $r = (1, \dots, p)$. To run a Wald test, the VAR (*p*) model can be written in a compact form (e.g. for the first combination, y_t^{+}),

$Y = DZ + \delta$, where

$Y \coloneqq (y_1^{+}, \dots, y_T^{+})\ (n\ x\ T)\ matrix,$

$D \coloneqq \left(v, A_1 \dots, A_p\right)\ (n\ x\ (1 + np))\ matrix,$

$$Z_t := \begin{pmatrix} 1 \\ y_t^+ \\ {y^+}_{t-1} \\ \vdots \\ y_{t-p+1}^+ \end{pmatrix} ((1+np)\ x\ 1)\ matrix, for\ t = 1, \dots, T,$$

$$Z := (Z_0 \dots, Z_{T-1})\ ((1+np)\ x\ T)\ matrix, and$$

$$\delta := (u_1^+, \dots, u_T^+)\ (n\ x\ T)\ matrix$$

The Wald statistic is $(C\beta)'\ [C((Z'Z)^{-1} \otimes S_U)C']^{-1}\ (C\beta)$, where $\beta = vec(D)$, being *vec(·)* the column-stacking operator; $\otimes$ is the Kronecker product and *C* is a $p\ x\ n(1+np)$indicator matrix with elements ones for restricted parameters and zeros for the rest of the parameters; $S_U = \frac{\hat{\delta}'_U \hat{\delta}_U}{T-q}$, where *q* is the numbers of parameters in each equation of the VAR model. Under the assumption of normality, the Wald statistic follows an asymptotic χ^2 distribution with the same degrees of freedom than the number of restrictions to be tested (in our case, equal to *p*). The null hypothesis of non-Granger causality, $H_0: C\beta = 0$, is rejected at the α level of significance (1%, 5% or 10%) according to the bootstrap critical values generated by GAUSS software.

4. Results

According with the econometric strategy described, in this section we present the estimation results to investigate the Granger causality relationships not only country by country but also allowing assymetries between the variables *GDP* and *Tourism* and the reverse. In the first step we use the methodology suggested by Emirmahmutoglu and Kose that is an extension of Toda-Yamamoto for a panel aprroach and secondly, Hatemi-J also as an extension of Toda and Yamamoto (1995) for a study country-by-country that additionally allow the study of assymetries. In the results of all these approaches are reported distinguishing by the direction of the causality, that is, depending on the hypotheses to be tested. The estimation results are presented in Tables 2-7, while table 8 show a summary of the main results.

The first approach panel shown in Table 2 reveal that there causality from origin GDP to Spanish tourism inbounds. While the inverse relationship does not show any causation. However, our econometric strategy is applied for the purpose of finding heterogeneous behavior in the observed countries. Table 3 containts the country-by-country analysis where the results support that causality relationships from GDP to tourism inbounds in 4 out of 9 countries analyzed, these are Germany, Netherlands, Switzerland and United Kingdom. Considering the effects of tourism on GDP, Table 3 also shows that no appear any effect in global terms.[4]

Finally, and even more importantly, our econometric approach to detect the different behaviors of these relationships, it is precisely this idea that the main contribution of our work resides. In this line, when the analysis is performed taking into account the asymmetries, these results change. In Table 4, the results of the positive effects show that a positive GDP shocks in the origin countries cause positive shocks in the Spanish tourism inbounds and vice versa. On this regard, only in the British case tourism inbounds is affected by their own positives GDP shocks. While, on the other hand, most tourist arrivals to Spain from Germany, the Netherlands and Portugal could be indicators of economic growth in their origin countries. For its part, Table 5 regarding the negative effects of these relationships are observed. These results argue that in Germany, Holland and Switzerland falling their GDP´s would affect the fall in tourist arrivals from these countries to Spain. Also in Belgium, France, the Netherlands, Portugal and Switzerland emerge that the decrease in tourist arrivals could be an indicator of the fall of GDP in these countries.

Besides having contrasted these differences in relationships when distinguishing between global and positive and negative effects, in Tables 6 and 7 show the mixed effects, which means that asymmetries can be from positive to negative and the reverse. These tables report information on perceptions and decisions taken by tourists depending on the state of the economy. Thus, when there are positive shocks in GDP drop of tourists from these countries would symptom of a residual perception of tourists and destination. On the contrary, these results allow contrast similarly that tourists perceive tourism in Spain as a luxury good. With all this, first, taking into account the table 6 and 7 only causality of positive GDP is seen falling to Swiss tourists.

Table 2. Panel Granger Causallity approach (Emirmahmutoglu and Kose´s (2011)

	$GDP\,f \nRightarrow Tour$	$Tour \nRightarrow GDPf$
Countries	Test statistic	Test statistic
1 Belgium	0.015	2.673
2 France	0.267	4.023

[4] As is shown the country results are the same as those in Table 2, however, while the first, to calculate pvalues has asymptotic using the original distribution, the chi-square. Table 3 (global effects) to ls pvalues has been used bootstrapping with 10,000 replications. However, in both cases, the results are identical.

3 Germany	6.331**	0.058
4 Italy	2.379	3.016
5 Netherlands	11.257***	1.561
6 Portugal	3.536	3.144
7 Switzerland	14.033***	1.692
8 U.K.	17.816***	0.19
9 USA	0.879	5.717

PANEL STATISTICS

	Bootstrap critical values				Bootstrap critical values		
Fisher test value	1%	5%	10%	Fisher test value	1%	5%	10%
44.295***	40.111	31.890	28.600	14.530	43.800	33.448	27.174

Note: Lag orders are selected by minimizing the Akaike Information Criteria.

***,**;* denotes significance at 1%, 5% and 10% respectively. The bootstrap distribution of Fisher test statistics is dervied from 10000 replications. Boostrap critical values are obtained at the 1,5 and 10% levels base don these empricial distributions.

Table 3. Global effects

	$GDP\ f \nRightarrow Tour$				$Tour \nRightarrow GDPf$			
	Test	Bootstrap critical values			Test	Bootstrap critical values		
Countries	statistic	1%	5%	10%	statistic	1%	5%	10%
1 Belgium	0.015	12.251	7.483	5.188	2.673	10.285	6.954	5.42
2 France	0.267	9.955	6.799	5.111	4.023	11.652	7.193	5.54
3 Germany	6.331*	11.664	6.804	5.123	0.058	10.572	6.901	5.38
4 Italy	2.379	13.955	8.586	7.04	3.016	13.031	8.528	6.517
5 Netherlands	11.257***	10.516	6.741	5.195	1.561	10.034	6.053	4.569
6 Portugal	3.536	4.987	6.64	10.365	3.144	10.171	5.723	4.41
7 Switzerland	14.033**	16.863	11.235	9.004	1.692	15.988	10.993	8.696
8 U.K.	17.816***	15.765	10.871	8.325	0.19	15680	11.151	8.908
9 USA	0.879	14.182	9.237	7.195	5.717	14.232	8.799	6.674

***Note*:** Lag orders are selected by minimizing the Akaike Information Criteria.

***,**;* denotes significance at 1%, 5% and 10% respectively.

B. Asymmetric Granger causality test.

Table 4. Positive effects

	$GDP\ f+\nRightarrow Tour+$				$Tour+\nRightarrow GDP\ f+$			
	Test	Bootstrap critical values			Test	Bootstrap critical values		
Countries	statistic	1%	5%	10%	statistic	1%	5%	10%
1 Belgium	2.189	10.856	6.639	4.914	1.035	10.668	6.76	5.088
2 France	0.051	10.72	6.359	4.993	0.778	9.07	6.549	5.276
3 Germany	6.298	18.657	12.537	10.654	10.872*	10.744	13.26	18.272
4 Italy	0.854	11.507	6.882	5.036	0.552	9.954	6.388	4.737
5 Netherlands	1.548	11.474	6.45	4.852	8.187**	13.289	6.497	4.794
6 Portugal	0.097	7.58	3.859	2.746	3.552*	7.369	4.385	2.995
7 Switzerland	1.818	13.402	8.886	6.696	2.554	14.267	9.051	7.111
8 U.K.	8.719*	14:045	10.634	8.669	2.153	16.618	11.41	8.786
9 USA	0.000	6.516	3.615	2.8	2.205	6.01	3.799	2.792

Note: Lag orders are selected by minimizing the Akaike Information Criteria.

***,**;* denotes significance at 1%, 5% and 10% respectively.

Table 5. Negative effects

	$GDP\ f-\nRightarrow Tour^{-}$				$Tour-\nRightarrow GDP\ f-$			
	Test	Bootstrap critical values			Test	Bootstrap critical values		
Countries	statistic	1%	5%	10%	statistic	1%	5%	10%
1 Belgium	0.803	9.604	6.436	4.966	6.735**	10.239	6.62	4.934
2 France	1.274	13.554	9.631	7.577	21.234***	20.565	10.109	7.572
3 Germany	7.747*	16.38	9.635	7.05	3.111	16.234	10.63	7.822
4 Italy	4.213	13.085	8.621	7.04	2.276	14.395	8.88	6.946
5 Netherlands	8.226*	19.916	10.152	7.488	10.58*	22.101	11.063	7.796
6 Portugal	1.169	13.454	9.3	7.077	11.387**	16.722	10.617	8.363
7 Switzerland	17.678**	18.55	12.896	10.354	24.243***	17.666	12.889	10.398
8 U.K.	8.548	16.132	10.741	8.989	3.497	16.765	10.43	8.498

9 USA	3.211	17.968	11.088	8.894	2.934	16.295	10.58	8.4

Note: Lag orders are selected by minimizing the Akaike Information Criteria.

***,**;* denotes significance at 1%, 5% and 10% respectively.

Table 6. Mixed effects (I)

	$GDPf+ \nRightarrow Tour^{-}$				$Tour+ \nRightarrow GDPf-$			
	Test	Bootstrap critical values			Test	Bootstrap critical values		
Countries	statistic	1%	5%	10%	statistic	1%	5%	10%
1 Belgium	0.339	11.154	6.761	5.17	0.326	14.995	8.221	5.35
2 France	0.011	7.615	4.441	3.049	0.747	16.456	6.888	4.753
3 Germany	0.803	16.694	11.051	8.948	0.519	12.905	7.12	5.014
4 Italy	4.684	13.033	7.054	5.128	0.373	9.179	6.437	4.684
5 Netherlands	2.884	11.208	6.706	5.12	0.286	10.032	6.035	4.56
6 Portugal	0.427	8.048	4.04	2.94	1.616	9.352	5.875	4.643
7 Switzerland	7.116*	12.829	8.956	6.681	0.55	11.446	7.075	5.039
8 U.K.	4.482	16.974	12.49	10.134	0.5	15.001	9.98	7.717
9 USA	0.197	7.373	4.087	2.849	0.333	11.648	6.864	4.986

Note: Lag orders are selected by minimizing the Akaike Information Criteria.

***,**;* denotes significance at 1%, 5% and 10% respectively.

Table 7. Mixed effects (II)

	$GDP- \nRightarrow Tour+$				$Tour- \nRightarrow GDP+$			
		Bootstrap critical values				Bootstrap critical values		
Countries	Test	1%	5%	10%	Test	1%	5%	10%
1 Belgium	1.041	12.201	7.43	4.776	2.592	9	6.348	4.815
2 France	0.648	13.173	6.989	5.262	0.224	6.863	4.074	2.997
3 Germany	0.432	13.419	8.079	5.251	8.844	18.731	8.254	8.891
4 Italy	0.239	10.26	6.927	5.329	0.139	12.556	7.378	4.176
5 Netherlands	2.72	10.113	6.866	5.122	0.279	10.652	6.234	4.835
6 Portugal	0.726	10.308	6.307	4.691	0.473	7.017	3.866	2.517

7	Switzerland	0.841	10.814	6.414	5.047	0.862	13.132	8.294	6.547
8	U.K.	3.8	17.172	11.522	9.432	4.57	18.089	12.733	10.483
9	USA	2.141	10.909	7.167	5.25	3.241*	8.3	4.24	2.995

Note: Lag orders are selected by minimizing the Akaike Information Criteria.

***,**;* denotes significance at 1%, 5% and 10% respectively.

In order to summarize our results, table 8 is presented where it have recognized two behaviors. First, it seems that the causalities of the countries found in the analysis of the overall effects are also found when asymmetries are allowed. In addition, these results show that the causalities differ depending on the cycle in which the relationship is observed, demonstrating that an analysis in which only contemplates the overall effects could be biased.

Table 8. Summary of Results

		GDP		
		Global	***Positive***	***Negative***
Tourism	***Global***	UK, Switzerland, Netherland and Germany		
	Positive		UK	
	Negative		Switzerland	Switzerland, Germany and Netherland

5. Conclusions

Great interest arise in the last decade to understand what is behind the relationship between economic growth and tourist flows. On this goal, the likely existence of the Granger causality to know the reaction of income shocks in the 9 countries from which Spain receives more tourists on the Spanish tourism flows for the period 2000-2016 have been analyzed as a novel approach in the existing litetature. Depending on the direction of the causality, several hypotheses are defined by Tugcu (2014), while most empirical works support the relationship sostained from tourism to grotwh in the so called TLG hypothesis, few interest emerge on the opposite direction, sostained by the conservation hypotheis. Our approach present two important advantages, first beacuse we can test how influence the economic status in the tourism inbounds using the origin GDP and, second, the use of assymetries allow to apply a more flexible study of the Granger Causallity. The method applied for analysis causality is a set of alternative tests which permit to detect the Granger causality taking into account both the longitudinal data, following the approaches by Toda and Yamamoto (1995) and Hatemi-J (2012) and the panal data proposed by Emirmahmutoglu and Kose´s (2011), as an extension of Toda and Yamamoto (1995). Our paper has contributed regarding previous empirical works the analyse of asymetric behavior on the relationship.

We support that the Granger causality appear from GDP to Tourism in four of the nine countries analyzed. First, a group of countries with a large influx of tourists to Spain is Germany, Holland, Switzerland and UK which represent 61% of total inbounds in 2016. These countries are sensitive in relation to the number of tourists traveling to Spain to the state of the economy of their countries of origin. On the other hand, differents behaviour in the tourism flows emerge when assymetries are allowed and so depending on the sign observed this relationship varies.

The growing interest has emerged to establish appropriate decisions on tourist resources due to its impact on economic development should take into account the results proposed in this paper. Thus, tourism policies be segmented by country, pushing proposals for common policies. The first one should note that in the UK when a positive shock this entails an increase in tourist arrivals occurs, the most persistent tourism because neither falls tourist arrivals to negative shocks. Second, policies in Switzerland, Holland and Germany must be aimed at preventing the arrival of tourists from these countries fall in times of crisis. Finally, the remaining countries show no sensitivity in the observed relationship, so that could be implemented ad-hoc policies to try to change this pattern, in order to get appropriate cycles policies. Finally, a possible work of future research could address the study of the causal link between the arrival of tourists from these nine countries have on the Spanish GDP, in what has traditionally been called TLG, in order to establish what tourists generate more wealth in our country taking into account the observed shocks.

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