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Tourism and Trade in Small Island Regions: The case of the Canary Islands

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Tourism and Trade in Small Island Regions: The case of the Canary Islands

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Abstract

The main objective of this paper is to study the relationship between international trade and tourism on small islands, i.e., territories that are quite dependent on the rest of the world. To that end, we explore the different forms this relationship can take and apply cointegration and Granger causality test for the case study of the Canary Islands. Results suggest a relationship between tourism and trade in both directions and a cointegration relationship.

JEL: F14

KEYWORDS: Tourism, International Trade, Cointegration, Causality tests.

1. INTRODUCTION

About three-fourths of small countries are islands of less than one million inhabitants. Small island regions suffer from limitations on economic performance, which include lack of diversification because of resource scarcity, income volatility due to extreme openness and export concentration, and an inability to generate self-sustained growth because of capital shortage and small market size (Demas, 1965). These facts have made small island regions highly dependent upon international trade.

Furthermore, these regions are often specialised in tourism due to the availability of accessible natural resources such as beaches, natural areas and sunny weather. In this case, tourism can lead to a concentration of resources in the service industry and an increase in revenue from raw material exports, which divert resources away from industrial and agricultural sectors to this tourism industry and to the service sector. This fact may lead to a deterioration in the conditions for the manufacturing and agricultural sectors,sending them into a decline. In the literature, these circumstances have often been named as the Dutch disease[1]. This concept was first developed by Corden and Neary (1982) and Corden (1984) and refers to the reaction of the economy when a boom in exports occurs through the discovery of natural resources or a new use for them. In this sense, a negative relationship between tourist arrivals and exports would be expected.

To the contrary, an incipient literature provides several channels for a positive link between tourism and trade. As a consequence, both flows could promote an increase in market size not only in a direct but also in an indirect way. This virtuous circle could facilitate economic growth in these territories[2]. Hence, the study of the potential complementary relationship between flows of goods and international tourism is of major interest, as it can promote economic growth. This relationship also reflects the importance of business strategies that capture the benefits from the complementarity between tourism and trade.

[1] Nowak and Sahli (2007) and Capó-Parrilla et al (2005) analyse "Dutch disease" for small islands tourism economies

[2] See, for instance, Ahmed and Kwan (1991), Kwan and Cotsomotis (1991), Marin (1992), Jin (1995) and Thornton (1997) for the relationship between trade and growth. Balaguer and Cantavella-Jordá (2002),

All the particularities previously mentioned motivate this analysis of the relationship between trade and tourism for small islands economies. In this sense, the special case of the Canary Islands is explored to shed light on the presence of Dutch disease or a virtuous circle in the nexus between them.

Canary Islands is a small island region specialized in tourism and strongly reliant on international trade. In fact, over 9 million visitors travel to the Canary Islands searching for beaches and sunny weather. According to *Tourism Satellite Account* of Instituto Canario de Estadística, the tourism sector represents around 31.09% of regional GDP and 30.47% of total employment on the islands in 2007. At the same time, the Canary Islands are a highly dependent region in terms of trade, which means a high intensity of trade flows, but also of trade imbalances. The high openness and low coverage rates, together with the specialisation of the economy in the tourism sector made the Canary Islands an interesting case study for the analysis of the relationship between trade and tourism flows on small islands regions.

The tourism sector of the Canary Islands rocketed in the 1960s, specialising its economy in sun and sand tourism. This allocative effect led to a specialisation in the service sector, which could expose the Canary Islands to the Dutch disease and could compromise its economic growth in coming years. Capó-Parrilla et al (2007) analyse the presence of Dutch disease in the Balearic and the Canary Islands finding evidence that both regions show signs of this phenomenon and suggest that regional governments should accurately assess the long term consequences of specialising in tourism.

Moreover, in small island regions imports may lead to leakages that reduce the economic impact of tourism. Hernandez (2004) analyses the impact of tourism consumption on GDP for the Canary Islands. His anaysis suggests that the specialisation of this region's economy in the tourist industry diverts resources from other activities, such as agricultural or manufacturing industries, which results in the demand of tradable goods by both residents and non-residents being satisfied to a large extent by imports.

Oh (2005), Nowak et al (2007) and Lee and Chang (2008) analyse the effect of tourism on economic development.

The main objective of this research is to analyse the relationship between trade and tourism for a small island region such as the Canary Islands. Our work provides an additional view of this link by studying simultaneously the short and long-run relationship between tourism and trade flows. The structure of this paper is as follows: the channels through which the relationship between trade and tourism can go are described in section 2; the empirical analysis is presented in section 3; and some conclusions from the analysis are drawn in section 4.

2. THE RELATIONSHIP BETWEEN TRADE AND TOURISM

The potential link between tourism and trade has been little explored in the literature. Some research has found empirical evidence in favour of the existence of a bidirectional relationship between tourism and trade flows. For instance, Kulendran and Wilson (2000), Shan and Wilson (2001) and Khan et al (2005) investigate whether a relationship between international trade and tourism exists by applying co-integration techniques and Granger-causality tests for Australia, China and Singapore respectively. Results suggest that there is a bilateral relationship between tourism and trade flows.

Santana-Gallego et al (2007) explore the nexus between trade and tourism variables from a time series perspective for the case study of the United Kingdom and from a cross-section point of view for the case of OECD countries. The results suggest, that in both cases, a long-term relationship between these two flows exists and the short-run causal link is mainly in the sense "tourism generates trade". Similarly, Saayman et al (2009) examine the relationship between tourist arrivals and trade in South Africa. The authors found that a long run relationship between trade and tourism seems to exist whereas, in relation to the short-term causal nexus, the evidence is stronger for the hypothesis that "trade causes tourism".

Chul et al (1995), Eilat and Einav (2004) and Santana et al (2009) estimate a model for tourist demand, where international trade is considered as one of its determinants. In all cases, international trade seems to be relevant to explain tourist demand and hence, it is suggested that there is a relationship in the sense "international trade causes tourism". In a similar way, Turner and Witt (2001) analyse tourist demand and find that international trade is one of the main determinants for business trips.

Lastly, several papers examine the link between trade and tourism focusing the analysis on specific products or regions. Aradhyula and Tronstad (2003) suggest that there is a role for government agencies to play in overcoming imperfect information related to trade opportunities by facilitating exploratory business ventures and tourist visits. Easton (1998) studies whether Canadian aggregate exports are complementary or substitutive to tourist arrivals finding some evidence of substitution of Canadian exports for tourist excursions to Canada. Finally Fischer and Gil-Alana (2005) focus on the case of German imports of Spanish wines finding that tourism has a positive effect on imports.

As shown above, although limited in number, there are some papers that have empirically proved the existence of a relationship between trade and tourism. Moreover, this relationship can be in one or two ways. Figure 1 presents the different channels through which the nexus between trade and tourism can go.

[Figure 1, here]

This figure collects a set of explanations provided by this incipient literature. As can be observed, most of them predict a complementary link between trade and tourism flows. Also Dutch disease is incorporated as an additional channel leading to a negative link between tourist arrivals and exports but a positive nexus between tourist arrivals and imports.

Capó et al (2007) present a theoretical framework for the presence of Dutch disease in economies with an important tourism industry. In a general way, the authors hold that the development of a tourism sector generates a movement of resources such as labour and capital from the tradable sector (agriculture and manufacturing) to the emerging sector (tourism) and the non-tradable sector (services and construction). This fact results in a reduction in production of the first two sectors and an increase in production of the non-tradable sectors. The fall in production of tradable goods causes a reduction in exports and consequently the internal demand requirements, which has also been augmented by tourist arrivals, are satisfied through an increase in imports.

3. EMPIRICAL ANALYSIS

In this section, the case study of the Canary Islands is used to analyse the relationship between trade and tourism flows in a small island economy. To that end, Granger causality tests augmented with the Error Correction Mechanism (ECM) are applied. Considering that ECM implies a cointegration relationship between the variables, the short and long term causality can be tested. Moreover, the impulse-response functions, which help to support the findings of the Granger causality test, are presented.

3.1 Data description

The Canary Islands are one of the main travel destinations in Spain. Specifically, it was the third region in terms of international tourist arrivals after Catalonia and the Balearic Islands in 2007. Figure 2 represents tourist arrivals to the region by country of origin, and it can be observed how the main sources of tourist to the islands are the United Kingdom, Germany and Mainland Spain. Indeed, about three-fourths of the total tourism that arrives to the Canary Islands comes from these origins.

[Figure 2, here]

Related to international trade, the commercial coverage rate for trade, including trade with mainland Spain, was around 18% so imports are five times greater than exports which give rise to a negative trade balance. As shown in Figure 3, the most important commercial partner of the region is mainland Spain representing more than 60% of total trade. Related to international trade, the main trade partners are Germany, United Kingdom and some African countries such as Morocco, Cameroon and Equatorial Guinea (Anuario Económico, Canarias 2007).

[Figure 3, here]

Tourism data used in this research are monthly tourist arrivals (Tou_t) by country of origin over the period January 1995 to March 2007. Related to trade data, exports (E_t), imports (I_t) and total trade (T_t) by country in thousands of euros are considered for the same period. The analysis is carried out for the main tourism markets of the Canary

Islands, i.e., United Kingdom, Germany, France, Netherlands and Sweden, and additionally for the total international tourist arrivals. Moreover, due to the special geographical features of the Canary Islands, it is possible and also relevant to analyse trade and tourism flows with mainland Spain (including the Balearic Islands).

Tourism data and trade data with mainland Spain were obtained from *Instituto Canario de Estadística* (ISTAC) and international trade data were taken from *"Estadísticas de Comercio Exterior"* (DATACOMEX). It is worth mentioning that trade data are deflated by using Spanish monthly consumer price index, obtained from the *Instituto Nacional de Estadística*, and all series are seasonally adjusted and expressed in logarithms.

3.2 Statistical properties of data

The main statistical properties of the variables used in the analysis are presented as followed. Figure 4 plots the series of total international tourist arrivals, exports, imports and total trade to the Canary Islands in logarithms. A close look at these series suggests that the four variables present an increasing trend. This pattern could indicate that trade and tourism variables are integrated.

[Figures 4, here]

Similarly, Figure 5 plots the series of tourist arrivals, exports, imports and total trade to the mainland Spain. Again, all series seem to be increasing with time, which could imply that trade and tourism are non-stationary.

[Figures 5, here]

The first step of our analysis is the study of the statistical properties of each variable, individually. For this purpose, we implement some classic methods to investigate whether the series are stationary I(0) or non-stationary I(1). In particular, we carry out the Augmented Dickey-Fuller (ADF) statistic to formally test the non-stationarity of trade and tourism flows with intercept and trend.

[Table 1, here]

As can be observed in Table 1, the null hypothesis of a unit root cannot be rejected at 1% significance level for almost all cases, except for exports and total trade to the United Kingdom. This result implies that all series are integrated of the same order, and hence cointegration between variables can be explored, although exports and trade with the United Kingdom are dropped from the analysis.

3.3 Trade and Tourism in the Canary Islands: Cointegration and causality analysis

This subsection presents the analysis of the causal link between trade and tourism and its long-run relationship. A time series y_{1t} Granger causes another time series y_{2t} if present value of y_{2t} can be better predicted by using past values of y_{1t} than by not doing so, considering also that other relevant information (including the past values of y_2) are used in either case. In that sense, the classical model to study the causality is the vector autoregression model (VAR) which can be written as follows:

$$\Delta y_{1t} = \sum_{i=1}^{p} \phi_{1i} \Delta y_{1t-i} + \sum_{i=1}^{p} \zeta_{1i} \Delta y_{2t-i} + u_{1t}$$
$$\Delta y_{2t} = \sum_{i=1}^{p} \phi_{2i} \Delta y_{1t-i} + \sum_{i=1}^{p} \zeta_{2i} \Delta y_{2t-i} + u_{2t} \qquad (1)$$

where y_{1t} and y_{2t} are the endogenous variables, both integrated of order 1, p is the lag length and u_{1t} and u_{2t} are the residuals.

However, if variables are I(1) and cointegrated, the traditional Granger causality test should not be used, and proper statistical inference can be obtained by analysing the causality relationship on the basis of the error correction model (ECM). According to the Granger Representation Theorem in Engle and Granger (1987), if y_{1t} and y_{2t} are both I(1) and are cointegrated, then an error correction term must exist which describes the short-run dynamics of the variables in the following general form $ECM_t = y_{1t} - \kappa - \psi y_{2t}$. The omission of ECM_{t-1} from the VAR would lead to misspecification and the OLS method being biased.

For this reason, the VAR should be redefined as a dynamic multi-equation model augmented with the error correction mechanism (VECM). Equation system (1) is rewritten as a new system of equations such as:

$$\Delta y_{1t} = \varphi_1 + \tau_1 t + \sum_{i=1}^{p} \alpha_{1i} \Delta y_{1t-i} + \sum_{i=1}^{p} \eta_{1i} \Delta y_{2t-i} + \gamma_1 ECM_{t-1} + u_{1t}$$

$$\Delta y_{2t} = \varphi_2 + \tau_2 t + \sum_{i=1}^{p} \alpha_{2i} \Delta y_{1t-i} + \sum_{i=1}^{p} \eta_{2i} \Delta y_{2t-i} + \gamma_2 ECM_{t-1} + u_{2t} \qquad (2)$$

In system (2), constants and linear trends are also allowed. The model is represented in differences, so constants φ_1 and φ_2 imply a linear time trend in the level and the linear trends $\tau_1 t$ and $\tau_2 t$ suppose a quadratic trend in the levels. Moreover, a constant and a linear trend are allowed in the error correction term in the form $ECM\text{-}1_t = y_{1t-1} - \mu - \lambda t - \beta y_{2t}$. The VECM is estimated by using Johansen's (1995) maximum likelihood method without restrictions being placed on the trend parameters.

System (2) allows us to test four different hypotheses. The first hypothesis is related to cointegration where the null-hypothesis is $H_0: \gamma_1 = 0$ (or $H_0: \gamma_2 = 0$). A chi-square statistic as $\chi^2(p)$ is used where p is the number of coefficients estimated in each equation, in this case p=1 because we are interested in the significance of the error correction term. The rejection of the null hypothesis suggests that both variables are cointegrated. Sims et al (1990) interpret this hypothesis as long-run neutrality, while Corradi et al (1990) consider the rejection of the null hypothesis as the existence of long-run causality. Thus, this test analyses not only the presence of cointegration between the series but also indicates long-run causality.

Related to the ECM, a second hypothesis related to the significance of the long-run elasticity can be explored, where the null-hypothesis is $H_0 : \beta_1 = 0$ (or $H_0 : \beta_2 = 0$). This null hypothesis implies that the elasticity between each tourist and trade variable is statistically significant, and the sign of this parameter suggests the sense of the relationship. If β_1 or β_2 are negative, it implies that the long run relationship between trade and tourism flow is complementary whereas, if the coefficients are positive, a substitutability relationship exits between the variables. Moreover, the significance of

parameter β strengthens the evidence for cointegration among the variables. The t-statistics of the β coefficients are sufficient for this purpose.

The third hypothesis that can be tested is the presence of short-run causality. So, in the first equation of system (2) the null hypothesis is: H_0:η_{11}=…=η_{1p}=0, while in the second equation, the null hypothesis is: H_0:α_{21}=…=α_{2p}=0. In this case, the statistic is distributed as a χ^2(p), p being the lag length of the VECM[3]. The rejection of the null hypothesis implies the existence of a short-run causality in the sense of Granger (1981).

Finally, the fourth hypothesis tested is whether the two sources of causation are jointly significant. In the first equation of system (2), the null hypothesis is: H_0:η_{11}=…=η_{1p}=γ_1=0 and, in the second equation, the null hypothesis is: H_0:α_{21}=…=α_{2p}= γ_2=0. Both of them are related to cointegration, due to the coefficients of the ECM, γ_1 and γ_2 being included in the null hypothesis. In this case, the statistic is distributed as a χ^2(p+1) p being the lag length of the VECM plus the ECM. The rejection of the null hypothesis implies that a long-run, short-run causality or both exist.

Equation system (2) allows us to analyse not only the cointegration between variables, which can be interpreted as a long-run relationship and the sense of this nexus, but also the Granger causality between them, which implies short-run causality. Table 2 presents a summary of the cointegration and causality analysis. Specifically, a summary of the results of the three hypotheses previously mentioned are presented[4].

[Table 2, here]

[3] In order to define the VAR, it is necessary to determine the optimum number of lags to assure that residuals are white noise. A reduced number of lags could impede the adequate capturing of the dynamics of the series. An excessive number of lags could lead to a loss of degrees of freedom in the estimation. The number of lags varies depending on the variables analysed and they are decided according to the Schwarz Information Criterium (SBIC) and the Hannan and Quinn Criterium (HQIC).

[4] Tables A.1, A.2 and A.3 in the appendix show the details of the results of the estimation for different pairs of relationships (Eq1) being the equation defined for y_{1t} and (Eq2) the equation defined for y_{2t}. In particular, Table A.1 refers to the analysis of the relationship between tourist arrivals and exports, Table A.2 refers to the causal nexus between tourist arrivals imports and finally, Table A.3 shows the results for the relationship between tourist arrivals and total trade. These tables present the estimations of VAR parameters, the ECM parameter, the β parameter and the χ^2-test for the analysis of the short run causality and the short and long run causality jointly.

As can be observed in Table 2, along with the first hypothesis, the ECM is significant in all cases. These results suggest that trade and tourism variables are cointegrated and that a long-run relationship between these flows exists. According to the second hypothesis the long-run coefficient β is significant in almost all cases and the sign of the coefficients are mainly negative implying that the relationship between trade and tourism variables is essentially complementary. That is, trade flows promotes tourism and viceversa. It is worthy noting the sign of the relationship between exports and tourism for the case of total international arrivals and Sweden is positive, suggesting that there is a substitutability link. These nexus could be indicating the presence of Dutch disease in the small tourism regions.

With regard to the third hypothesis where the short-run causal nexus is tested, the results show that short-run relationships exist in around half of the cases (10 of 19) analysed. Among these 10 cases, where a causal nexus between trade and tourism flows exists, the relationship is bidirectional in 4 cases whereas, it is unidirectional and mainly in the sense tourism generates trade, namely imports, exports or total trade, in 5 of the 10 cases.

Related to the fourth hypothesis where the short and long run causality is jointly tested, results suggest that in all cases long-run, short-run causality or both exist. This causal nexus is bidirectional in the half of the cases (10 of 19) whereas, the unidirectional relationship is mostly (in 7 of 9 unidirectional cases) in the sense "tourism causes trade flows".

Finally, to complement the results obtained from the Granger causality test, the impulse-response functions are estimated. Impulse-response functions are computed to give an indication of the system's dynamic behaviour and also to show how a variable in the VECM system responds to a single 1 percent exogenous change in another variable of interest.

[Figures 6 and 7, here]

Figures 6 and 7 illustrate the estimated impulse-response function for 8 months. Figure 6 represents impulse-response for the case of total international trade and tourism, while

Figure 7 shows the relationship between these variables for the case of mainland Spain[5]. It can be observed how in all cases, an exogenous shock has an effect on the other variable and also that this effect appears to die out very quickly.

Specifically, the shocks both in trade and tourism have a greater influence on total tourism and trade variables, respectively, between the first and third month rather than over longer term horizons. Moreover, it can also be observed how a unitary shock in tourism has a greater impact on trade variables, and it is more persistent than for the opposite case.

In general, the results of the impulse response functions for the variables in this study are consistent with the results obtained from the Granger causality test that suggest a link between trade and tourism variables.

4. Conclusions

The aim of this paper is to investigate the empirical relationship between tourist arrivals and trade variables for small island regions dependent on the rest of the world. To that end, the case of the Canary Islands' trade and tourism with other countries and mainland Spain are analysed. Empirical evidence for a relationship between tourism and trade is provided and several ways through which the link can go are described. The analysis explores both the long and the short run relationship between trade and tourism flows by estimating a VECM and applying Granger causality tests.

In most cases, the results suggest a long-term relationship between tourism and trade and this relationship is mainly positive, which means that trade and tourism flows are complementary. This is an important implication of our analysis because it means that trade increases tourism and viceversa. Since growth theory proposes that trade (and tourism as a kind of trade) promotes growth via increased market size, this effect can be encouraged by a virtuous complementary relationship between flows of tourists and trade.

[5] Impulse-response functions for the rest of the countries considered in the analysis have been carried out and are available upon request.

Evidence of the Dutch disease can only be found for the case of total international arrivals and trade with Sweden, where the long-run relationship between exports and tourism is negative. This link could be explained because of the specialisation of the Canary Island economy on the production of non-tradable goods (service sector), which also causes a decrease in the production of the tradable ones and thereby generating a reduction in exports.

With respect to the short-run causality, although evidence of a two-way relationship is found, it is mainly in the direction tourism causes trade. Therefore, government policies oriented to increasing tourist arrivals not only have a direct effect on the region's economy but also an indirect promotional effect on international trade.

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Figure 1. Tourism-Trade links

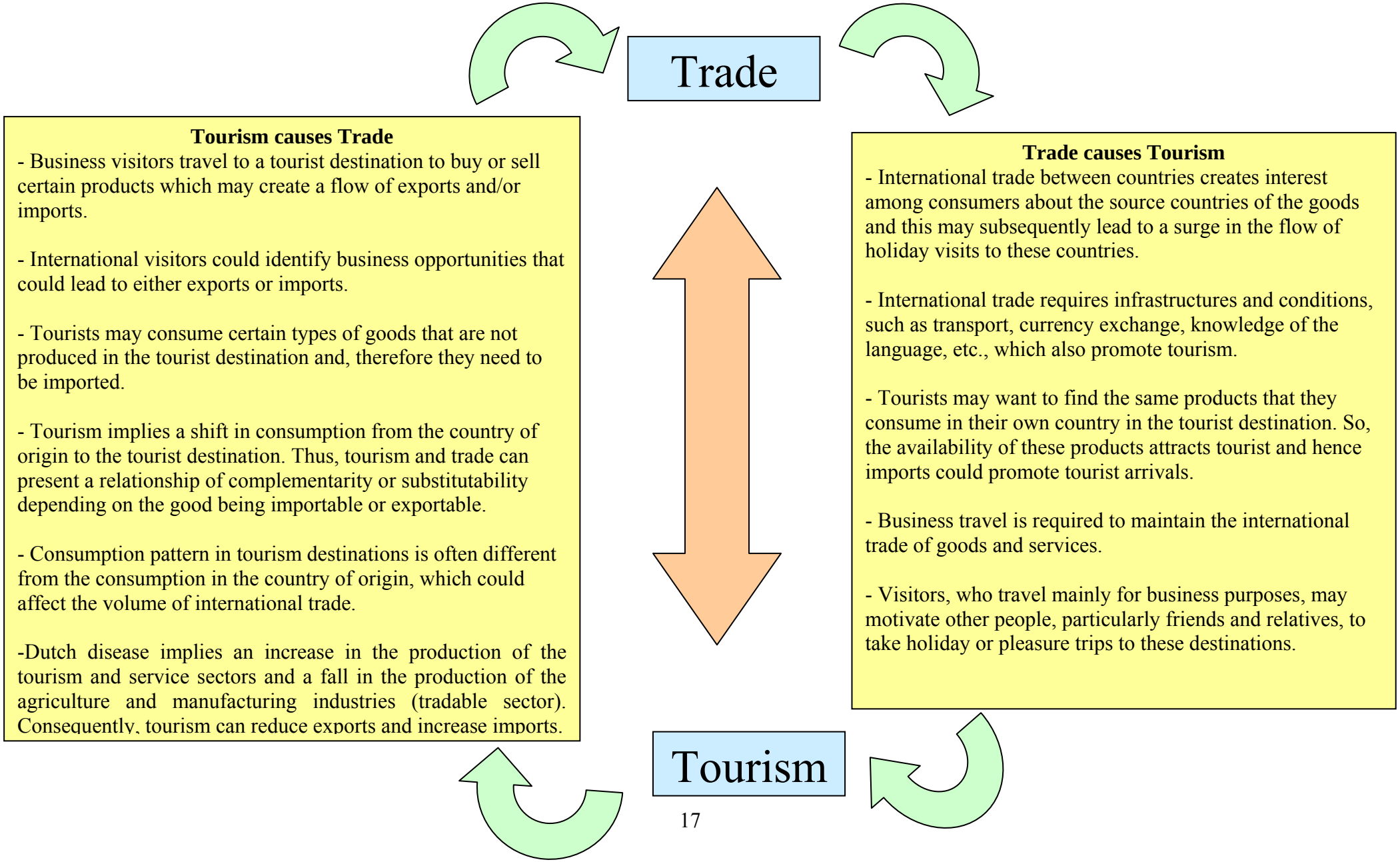


Figure 2. Main origins of tourist arrivals to the Canary Islands

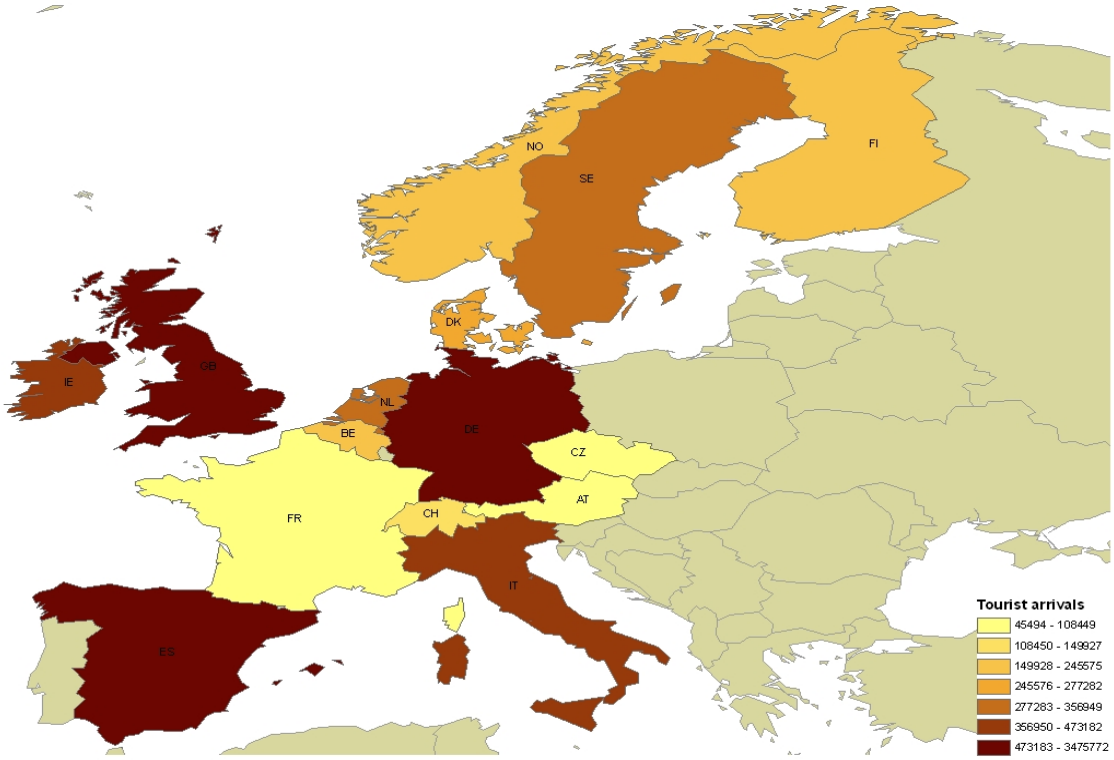


Figure 3. Main trade partners of Canary Islands

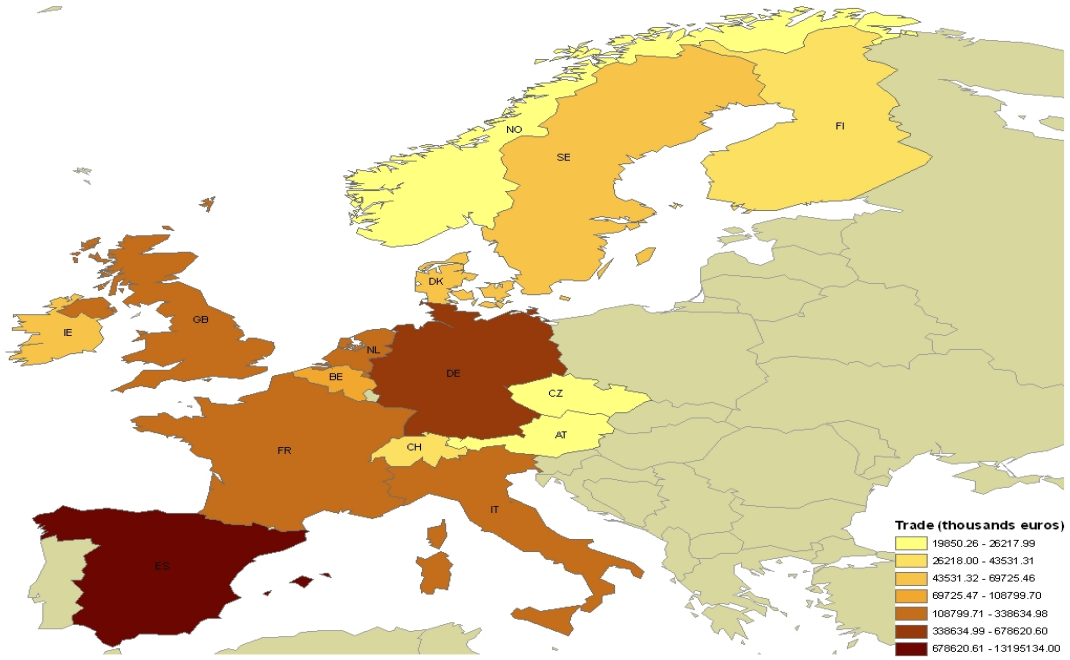


Figure 4. Total International tourist arrivals, exports, imports and total trade

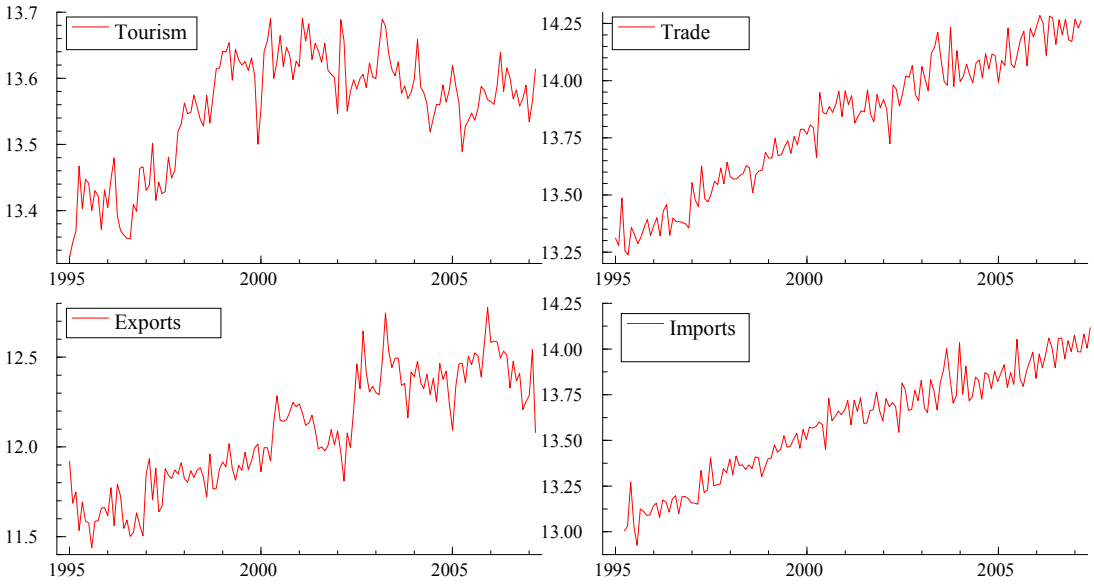


Figure 5, Mainland Spain tourist arrivals, exports, imports and total trade

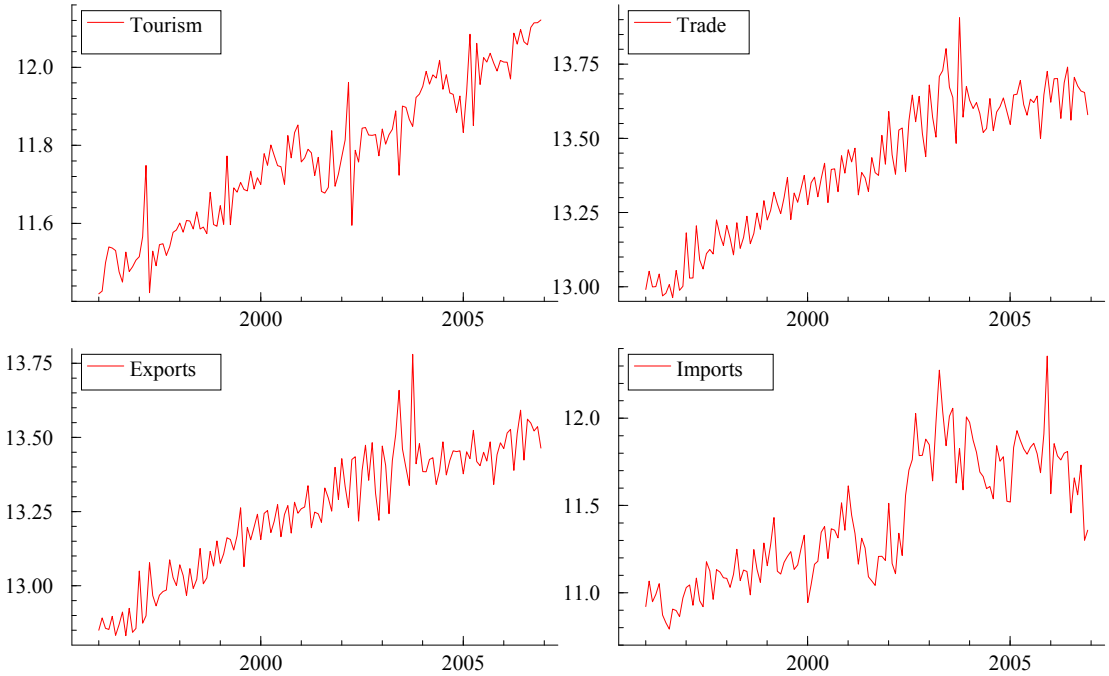


Tabla 1. ADF Unit roots tests

Series		Mainland Spain	Total International Tourist	Germany	United Kingdom	France	Netherlands	Sweden
	lags	5	8	7	11	8	9	12
Tourist	**cte**	[0.9628]	[0.0173]	[0.3082]	[0.2872]	[0.7124]	[0.2778]	[0.5159]
Arrivals	**trend**	[0.0854]	[0.6424]	[0.3147]	[0.9339]	[0.0277]	[0.9354]	[0.5328]
	lags	9	9	12	12	3	12	11
	cte	[0.3338]	[0.6795]	[0.2452]	[0.0000]	[0.0141]	[0.0664]	[0.1174]
Exports	**trend**	[0.7316]	[0.2848]	[0.3154]	[0.0000]	[0.0675]	[0.0868]	[0.2966]
	lags	8	12	12	12	12	11	12
	cte	[0.4350]	[0.6879]	[0.4959]	[0.4175]	[0.1062]	[0.4594]	[0.3221]
Imports	**trend**	[0.8300]	[0.6283]	[0.6425]	[0.2659]	[0.0759]	[0.1568]	[0.0043]
	lags	9	12	12	3	12	11	12
	cte	[0.2582]	[0.8375]	[0.6393]	[0.0124]	[0.1480]	[0.2152]	[0.2548]
Trade	**trend**	[0.9315]	[0.2076]	[0.6229]	[0.0095]	[0.0439]	[0.4177]	[0.0025]

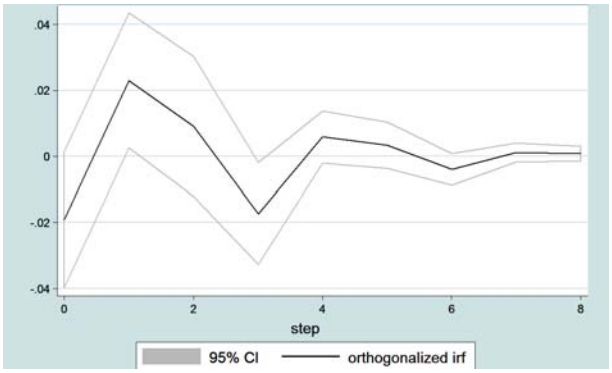
Nota: MacKinnon approximate p-value between brackets

Table 2. Summary of cointegration and causality analysis

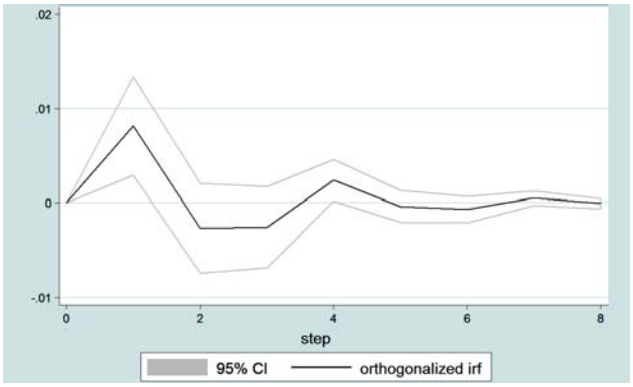
	Tourist Arrivals-Trade Flow	ECM	β	Short-Run Causality	Short and Long-Run causality
Mainlan Spain	**Exports**	Yes	No	No	E → T
	Imports	Yes	No	I ↔ T	I ↔ T
	Trade	Yes	(+)	No	TT → T
Total International	**Exports**	Yes	(-)	E ↔ T	E ↔ T
	Imports	Yes	No	I ← T	I ↔ T
	Trade	Yes	(-)	TT ← T	TT ← T
Germany	**Exports**	Yes	+	No	E ↔ T
	Imports	Yes	(-)	I ← T	I ← T
	Trade	Yes	(-)	TT ← T	TT ← T
United Kingdom	**Imports**	Yes	(-)	I ↔ T	I ↔ T
France	**Exports**	Yes	No	E ↔ T	E ↔ T
	Imports	Yes	(-)	No	I ↔ T
	Trade	Yes	(-)	No	TT ↔ T
Netherlands	**Exports**	Yes	(+)	E → T	T → E
	Imports	Yes	(+)	No	I ↔ T
	Trade	Yes	(+)	No	TT ↔ T
Sweden	**Exports**	Yes	(-)	T → E	T → E
	Imports	Yes	(-)	No	I ← T
	Trade	Yes	(-)	No	TT ← T

Figure 6, Impulse-Response Functions. Total International Tourism and Trade

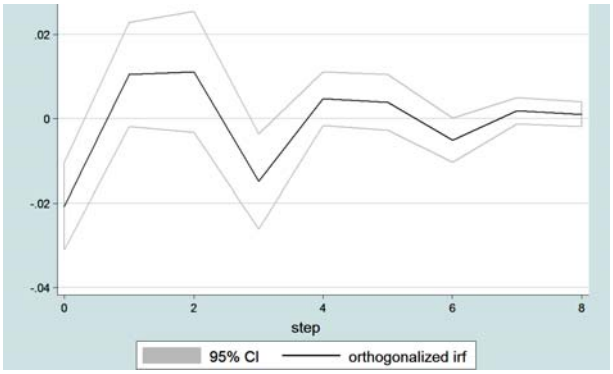
(i) Impulse (Tourism), Response (Exports)



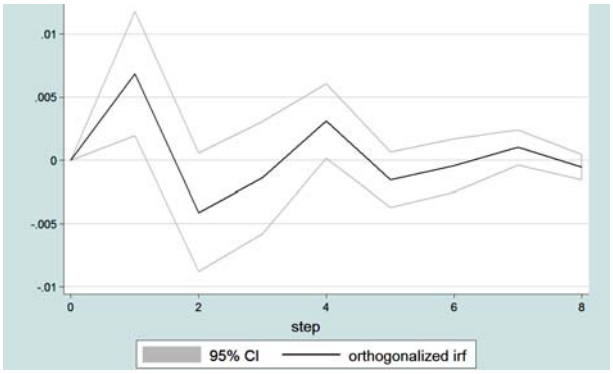
(ii) Impulse (Exports), Response (Tourism)



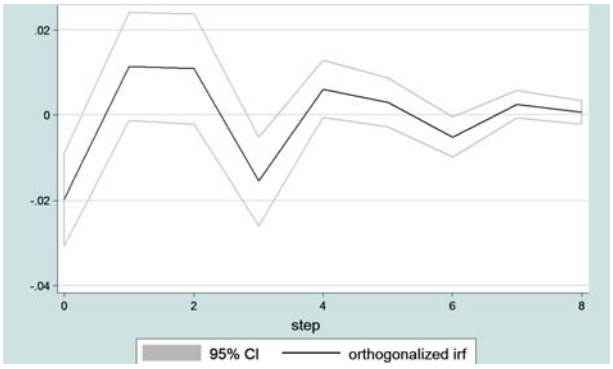
(ii) Impulse (Tourism), Response (Imports)



(iv) Impulse (Imports), Response (Tourism)



(v) Impulse (Tourism), Response (Total Trade)



(vi) Impulse (Total Trade), Response (Tourism)

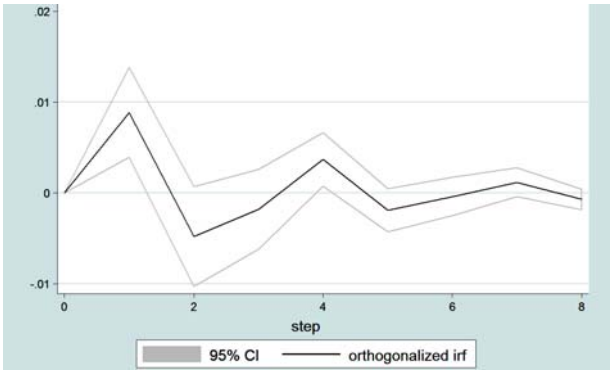
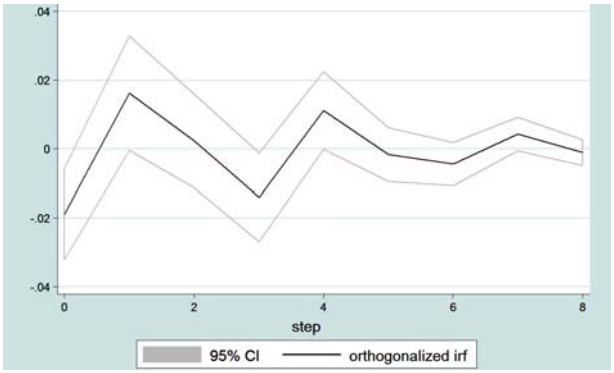
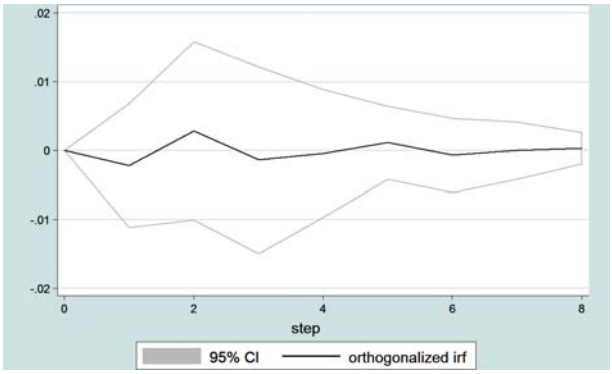


Figure 7, Impulse-Response Functions. Mainland Spain Tourism and Trade

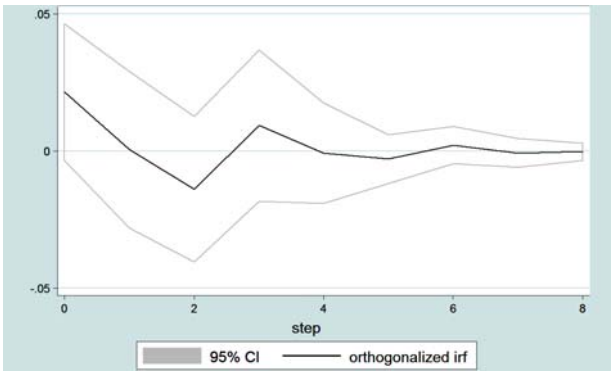
(i) Impulse (Tourism), Response (Exports)



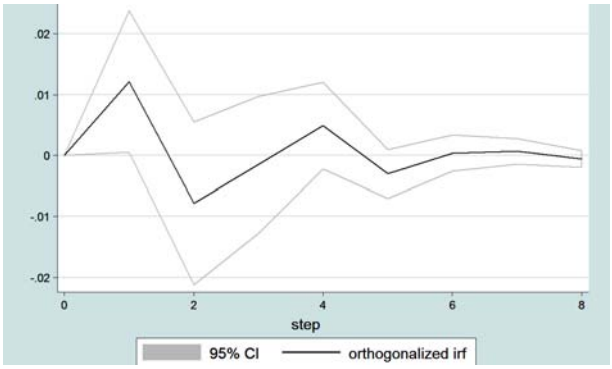
(ii) Impulse (Exports), Response (Tourism)



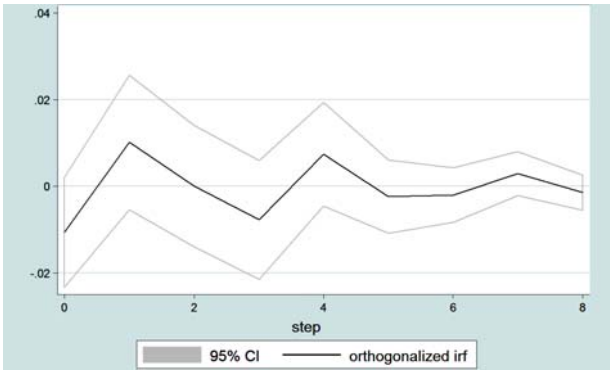
(iii) Impulse (Tourism), Response (Imports)



(iv) Impulse (Imports), Response (Tourism)



(v) Impulse (Tourism), Response (Total Trade)



(vi) Impulse (Total Trade), Response (Tourism)

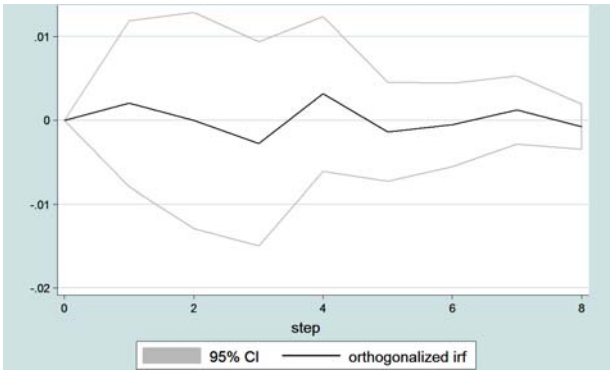


Table A.1. Cointegration and Causality analysis. Tourist arrivals-Exports

	Mainland Spain		Total International		Germany		France		Netherland		Sweden	
	Eq1	**Eq2**	**Eq1**	**Eq2**	**Eq1**	**Eq2**	**Eq1**	**Eq2**	**Eq1**	**Eq2**	**Eq1**	**Eq2**
	-0.3249	0.0163	-0.2947	0.5346	-0.4943	-0.7175	-0.3508	-2.7121	-0.4303	-0.0259	-0.5776	1.0010
T_{t-1}	(-2.57)	(0.10)	(-3.77)	(1.90)	(-5.41)	(-1.37)	(-3.17)	(-3.51)	(-5.37)	(-0.06)	(-6.90)	(2.62)
	-0.0764	0.1015	-0.1908	0.6863	-0.3449	-0.1657	-0.3151	-2.3194	-0.3217	0.6288	-0.1242	1.0970
T_{t-2}	(-0.83)	(0.81)	(-2.44)	(2.43)	(-4.24)	(-0.36)	(-2.71)	(-2.86)	(-4.01)	(1.43)	(-1.48)	(2.87)
	-	-	-	-	-	-	0.1503	-1.8716	-	-	-	-
T_{t-3}	-	-	-	-	-	-	(1.29)	(-2.29)	-	-	-	-
	-	-	-	-	-	-	0.0256	-1.7188	-	-	-	-
T_{t-4}	-	-	-	-	-	-	(0.22)	(-2.07)	-	-	-	-
	-	-	-	-	-	-	0.2512	-2.8899	-	-	-	-
T_{t-5}	-	-	-	-	-	-	(2.45)	(-4.04)	-	-	-	-
	-	-	-	-	-	-	0.2563	-1.3040	-	-	-	-
T_{t-6}	-	-	-	-	-	-	(2.93)	(-2.13)	-	-	-	-
	-0.0213	-0.7513	0.0662	-0.3357	-0.0190	-0.4049	-0.0260	-0.6281	0.0052	-0.0001	0.0249	-0.1099
E_{t-1}	(-0.36)	(-9.38)	(2.76)	(-3.88)	(-1.25)	(-4.67)	(-2.10)	(-7.27)	(0.28)	(0.00)	(1.07)	(-1.03)
	-0.0087	-0.4966	0.0287	-0.1778	-0.0066	-0.1863	-0.0158	-0.3480	0.0289	0.0677	0.0037	-0.1299
E_{t-2}	(-0.15)	(-6.22)	(1.29)	(-2.22)	(-0.45)	(-2.21)	(-1.12)	(-3.54)	(1.87)	(0.80)	(0.20)	(-1.54)
	-	-	-	-	-	-	-0.0431	-0.1524	-	-	-	-
E_{t-3}	-	-	-	-	-	-	(-2.97)	(-1.50)	-	-	-	-
	-	-	-	-	-	-	-0.0366	-0.2268	-	-	-	-
E_{t-4}	-	-	-	-	-	-	(-2.45)	(-2.17)	-	-	-	-
	-	-	-	-	-	-	-0.0640	-0.2285	-	-	-	-
E_{t-5}	-	-	-	-	-	-	(-4.45)	(-2.27)	-	-	-	-
	-	-	-	-	-	-	-0.0119	-0.1809	-	-	-	-
E_{t-6}	-	-	-	-	-	-	(-0.90)	(-1.97)	-	-	-	-
	-6.88E-06	-1.10E-04	-9.15E-05	7.66E-06	3.56E-05	6.57E-06	4.93E-04	1.69E-04	-1.81E-04	-1.42E-06	-2.51E-04	2.05E-05
Trend	(-0.05)	(-0.59)	(1.54)	(0.04)	(0.30)	(0.01)	(2.40)	(0.12)	(-1.24)	(0.00)	(-0.89)	(0.02)
	0.0042	0.0178	0.0110	0.0008	-0.0007	0.0015	-0.0662	-0.0129	0.0156	-0.0022	0.0226	-0.0037
Constant	(0.40)	(1.25)	(1.89)	(0.04)	(-0.07)	(0.03)	(-3.61)	(-0.10)	(1.27)	(-0.03)	(0.96)	(-0.03)
	-0.6712	0.0419	-0.0161	-0.1921	-0.2155	1.1679	-0.4136	1.2042	-0.0040	0.5078	-0.0380	-0.4655
MCE	(-4.83)	(0.22)	(1.01)	(3.36)	(-2.93)	(2.78)	(-4.14)	(1.72)	(-0.26)	(6.08)	(-2.03)	(-5.44)
	-0.0037	-	1.25609	-	-0.1053	-	-0.0379	-	-1.3591	-	1.4350	-
β												
	(-0.03)	-	(3.59)	-	(-1.94)	-	(-1.18)	-	(-6.52)	-	(5.83)	-
	0.13	1.1	7.64	7.68	2.09	1.58	28.62	24.41	4.47	2.37	1.48	9.93
S-R causality	[0.9357]	[0.5756]	[0.0219]	[0.0215]	[0.3514]	[0.4529]	[0.0001]	[0.0004]	[0.1068]	[0.3051]	[0.4775]	[0.007]
	23.45	1.19	7.87	16.62	8.06	8.81	42.1	25.39	5.40	40.02	5.37	38.98
S-R and L-R Cuusality	[0.0000]	[0.7564]	[0.0489]	[0.0008]	[0.0448]	[0.0320]	[0.0000]	[0.0006]	[0.1444]	[0.0000]	[0.1469]	[0.0000]

Nota: Eq1 and Eq2 represent the first and second equation in the VECM respectively. In Eq1 the dependent variable is tourist arrivals whereas, in Eq2 it is exports. t-student statistic appears between parethesis and p-values appear between brackets.

Table A.2. Cointegration and Causality analysis. Tourist arrivals-Imports

	Mainland Spain		Total International		Germany		United Kingdom		France		Netherlands		Sweden	
	Eq1	**Eq2**	**Eq1**	**Eq2**	**Eq1**	**Eq2**	**Eq1**	**Eq2**	**Eq1**	**Eq2**	**Eq1**	**Eq2**	**Eq1**	**Eq2**
	-0.3878	0.9015	-0.1349	-0.4497	-0.0420	-0.1415	-0.3643	-0.9603	-0.6959	-0.2648	-0.4428	-0.1583	-0.5929	0.0396
$\mathbf{T_{t-1}}$	(-3.18)	(2.67)	(-1.57)	(-2.72)	(-0.31)	(-0.33)	(-3.96)	(-2.25)	(-8.24)	(-1.27)	(-5.36)	(-0.68)	(-6.97)	(0.20)
	-0.1071	0.3411	-0.0771	0.0205	-0.1112	-0.1284	-0.1513	-1.2029	-0.4908	-0.0610	-0.3150	-0.3344	-0.1219	-0.1916
$\mathbf{T_{t-2}}$	(-1.19)	(1.37)	(-0.88)	(0.12)	(-0.93)	(-0.34)	(-1.55)	(-2.66)	(-5.22)	(-0.26)	(-3.83)	(-1.43)	(-1.43)	(-0.98)
	-	-	-0.0124	-0.1042	0.1070	-0.1905	0.0151	-0.7016	0.0538	-0.3181	-	-	-	-
$\mathbf{T_{t-3}}$	-	-	(-0.15)	(-0.63)	(1.09)	(-0.62)	(0.15)	(-1.54)	(0.65)	(-1.55)	-	-	-	-
	-	-	-0.1463	0.1880	-0.0430	0.0673	-0.0669	-0.3171	-	-	-	-	-	-
$\mathbf{T_{t-4}}$	-	-	(-1.82)	(1.22)	(-0.54)	(0.27)	(-0.77)	(-0.79)	-	-	-	-	-	-
	0.0897	-0.4765	-0.1339	-0.3336	-0.1537	-0.8048	0.0168	-0.0525	-0.0164	-0.3359	0.0342	-0.5047	-0.0371	-0.1716
$\mathbf{I_{t-1}}$	(2.94)	(-5.65)	(-1.47)	(-1.90)	(-2.96)	(-4.94)	(0.46)	(-0.31)	(-0.31)	(-2.58)	(0.96)	(-4.98)	(-0.70)	(-1.41)
	0.0572	-0.2902	-0.0644	-0.4153	-0.0635	-0.6213	-0.0238	-0.0763	0.0155	-0.2119	0.0264	-0.3852	-0.0320	-0.0666
$\mathbf{I_{t-2}}$	(1.82)	(-3.34)	(-0.82)	(-2.77)	(-1.25)	(-3.90)	(-0.76)	(-0.53)	(0.33)	(-1.85)	(0.93)	(-4.76)	(-0.87)	(-0.79)
	-	-	-0.0110	-0.3203	0.0189	-0.4075	0.0222	-0.0939	0.0120	-0.1215	-	-	-	-
$\mathbf{I_{t-3}}$	-	-	(-0.18)	(-2.78)	(0.43)	(-2.99)	(0.87)	(-0.79)	(0.34)	(-1.40)	-	-	-	-
	-	-	0.0303	-0.1428	0.0337	-0.1318	0.0078	0.0646	-	-	-	-	-	-
$\mathbf{I_{t-4}}$	-	-	(0.73)	(-1.78)	(1.15)	(-1.43)	(0.42)	(0.74)	-	-	-	-	-	-
	1.53E-04	-8.71E-05	-9.56E-05	-3.89E-05	-8.21E-06	-1.21E-05	-8.47E-05	-1.15E-06	-1.80E-05	-5.37E-06	-1.66E-04	-1.54E-05	-2.44E-04	1.38E-06
Trend	(1.10)	(-0.23)	(-1.64)	(-0.35)	(0.08)	(-0.04)	(-1.11)	(0.00)	(-0.09)	(-0.01)	(-1.12)	(-0.04)	(-0.86)	(0.00)
Constant	-0.0014	0.0077	0.0160	0.0118	0.0065	0.0142	0.0087	0.0005	-0.0099	0.0003	0.0147	0.0031	0.0212	0.0028
	(-0.14)	(0.27)	(2.57)	(0.99)	(0.76)	(0.53)	(1.36)	(0.02)	(-0.59)	(0.01)	(1.21)	(0.09)	(0.89)	(0.05)
	-0.5991	-1.0537	-0.1878	0.4619	-0.8396	0.5686	-0.0110	0.8046	-0.0911	0.3047	0.0104	-0.1121	0.0005	0.0809
MCE	(-4.54)	(-2.89)	(-3.26)	(4.17)	(5.31)	(1.15)	(-0.34)	(5.33)	(-2.45)	(3.33)	(0.92)	(-3.52)	(0.08)	(6.10)
	0.0731	-	-1.6986	-	-0.2974	-	-1.2380	-	-1.4853	-	3.3444	-	-10.9553	-
β	(1.65)	-	(-8.49)	-	(8.63)	-	(-7.23)	-	(-4.49)	-	(3.70)	-	(-6.08)	-
	9.16	7.76	4.93	11.59	0.98	21.04	11.5	8.78	0.87	4.99	1.1	2.09	0.76	1.68
S-R causality	[0.0103]	[0.0207]	[0.2944]	[0.0207]	[0.9124]	[0.0003]	[0.0215]	[0.0668]	[0.8334]	[0.1727]	[0.5774]	[0.3511]	[0.6824]	[0.4313]
S-R and L-R	27.43	9.25	23.67	27.58	4.33	47.48	14.03	30.53	15.1	17.39	6.18	17.1	1.9	39.39
Cuusality	[0.0000]	[0.0261]	[0.0003]	[0.0000]	[0.5025]	[0.0000]	[0.0154]	[0.0000]	[0.0045]	[0.0016]	[0.1031]	[0.0007]	[0.5942]	[0.0000]

Nota: Eq1 and Eq2 represent the first and second equation in the VECM respectively. In Eq1 the dependent variable is tourist arrivals whereas, in Eq2 itis imports. t-student statistic appears between parethesis and p-values appear between brackets.

Table A.4 Cointegration and Causality analysis. Tourist arrivals-Total Trade

	Mainland Spain		**Total International**		**Germany**		**France**		**Netherland**		**Sweden**	
	Ec1	**Ec2**	**Ec1**	**Ec2**	**Ec1**	**Ec2**	**Ec1**	**Ec2**	**Ec1**	**Ec2**	**Ec1**	**Ec2**
	-0.8146	0.0567	-0.2118	-0.1795	-0.0173	-0.4031	-0.7398	-0.2194	-0.4293	0.0650	-0.5960	0.0806
$\mathbf{TT_{t-1}}$	(-10.34)	(0.90)	(-2.59)	(-1.18)	(-0.13)	(-1.01)	(-8.74)	(-1.11)	(-5.26)	(0.28)	(-7.03)	(0.43)
	-0.5097	0.0473	-0.1665	0.3065	-0.0854	-0.3279	-0.4981	-0.0939	-0.3039	-0.1666	-0.1208	-0.1214
$\mathbf{TT_{t-2}}$	(-6.50)	(0.75)	(-1.99)	(1.98)	(-0.72)	(-0.94)	(-5.15)	(-0.42)	(-3.74)	(-0.73)	(-1.42)	(-0.65)
	-	-	-0.1018	0.0976	0.1266	-0.2555	0.0621	-0.3068	-	-	-	-
$\mathbf{TT_{t-3}}$	-	-	(-1.21)	(0.63)	(1.28)	(-0.89)	(0.73)	(-1.54)	-	-	-	-
	-	-	-0.2020	0.3745	-0.0338	0.0039	-	-	-	-	-	-
$\mathbf{TT_{t-4}}$	-	-	(-2.50)	(2.50)	(-0.42)	(0.02)	-	-	-	-	-	-
	0.1787	-0.3233	0.0749	-0.5401	-0.1808	-0.6957	-0.0002	-0.2537	0.0410	-0.2934	-0.0372	-0.2190
$\mathbf{T_{t-1}}$	(1.14)	(-2.57)	(1.05)	(-4.08)	(-3.22)	(-4.25)	(-0.00)	(-1.99)	(1.14)	(-2.89)	(-0.67)	(-1.81)
	0.1339	-0.0679	0.0890	-0.4419	-0.0824	-0.5608	0.0338	-0.1357	0.0434	-0.3524	-0.0382	-0.0860
$\mathbf{T_{t-2}}$	(1.17)	(-0.74)	(1.30)	(-3.48)	(-1.52)	(-3.55)	(0.70)	(-1.21)	(1.47)	(-4.25)	(-0.99)	(-1.02)
	-	-	0.0725	-0.2155	0.0021	-0.3437	-0.0003	-0.0569	-	-	-	-
$\mathbf{T_{t-3}}$	-	-	(1.24)	(-1.98)	(0.04)	(-2.55)	(-0.01)	(-0.66)	-	-	-	-
	-	-	0.0588	-0.0423	0.0208	-0.1379	-	-	-	-	-	-
$\mathbf{T_{t-4}}$	-	-	(1.35)	(-0.52)	(0.66)	(-1.50)	-	-	-	-	-	-
	-0.0001	0.0000	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0002	0.0000	-0.0002	0.0000
Trend	(-0.79)	(0.33)	(-1.49)	(-0.21)	(0.28)	(0.10)	(0.08)	(0.01)	(-1.16)	(-0.04)	(-0.88)	(0.01)
	0.0164	-0.0019	0.0120	0.0059	0.0041	0.0089	-0.0135	-0.0005	0.0145	0.0018	0.0215	0.0020
Constant	(1.23)	(-0.18)	(1.92)	(0.51)	(0.48)	(0.36)	(-0.79)	(-0.01)	(1.20)	(0.05)	(0.91)	(0.04)
	-0.0183	-0.0543	-0.0469	0.1797	-0.8545	0.8527	-0.0196	0.1042	0.0042	-0.0494	0.0011	0.0434
MCE	(-1.26)	(-4.66)	(-1.64)	(3.39)	(-5.51)	(1.89)	(-1.75)	(3.98)	(0.99)	(-4.09)	(0.33)	(5.78)
	12.0672	-	-2.425856	-	-0.3396	-	-5.1782	-	9.2009	-	-18.9727	-
β	(5.23)	-	(-4.14)	-	(-9.17)	-	(-4.56)	-	(4.16)	-	(-5.79)	-
	0.9	1.57	2.34	12.68	1.57	19.62	1.44	3.86	2.3	0.83	0.98	1.26
S-R causality	[0.6374]	[0.4564]	[0.6731]	[0.0129]	[0.814]	[0.0006]	[0.6967]	[0.2766]	[0.3171]	[0.6588]	[0.6113]	[0.5333]
	22.36	2.06	20.54	25.86	5.82	45.95	9.9400	22.57	9.79	18.55	2.94	35.4
S-R and L-R Cuusality	[0.0001]	[0.5608]	[0.0010]	[0.0001]	[0.3241]	[0.0000]	[0.0415]	[0.0002]	[0.0204]	[0.0003]	[0.4012]	[0.0000]

Nota: Eq1 and Eq2 represent the first and second equation in the VECM respectively. In Eq1 the dependent variable is tourist arrivals whereas, in Eq2 it is trade. t-student statistic appears between parethesis and p-values appear between brackets.