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In this article, we calculate the economic impact of pilgrimage to Santiago de Compostela in the NUTS 2 region Galicia (Spain) in 2010. This economic impact is relevant to policymakers and other stakeholders dealing with religious tourism in Galicia. The analysis is based on the Input-Output model. Location Quotient formulas are used to derive the regional Input-Output table from the national Input-Output table of Spain. Both the Simple Location Quotient formula and Flegg's Location Quotient formula are applied. Furthermore, a sensitivity analysis is carried out. We found that pilgrimage expenditures in 2010 created between €59.750 million and €99.575 million in Gross Value Added and between 1,362 and 2,162 jobs. Most of the impact is generated within the 'Retail and Travel Services' industry, but also the 'Industry and Manufacturing', 'Services' and 'Financial and Real Estate Services' industries benefit from pilgrimage expenditures. This research indicates that in even in the most conservative scenario, the impact of pilgrimage is significant on the local economy of Galicia.

Key Words: Pilgrimage, Santiago de Compostela, Galicia, regional economic impact, input-output model, simple location quotient, Flegg's location quotient, gross value added, employment

Introduction

Pilgrimage is the movement of a traveller or group of travellers making a journey for religious purposes, nowadays also called a traditional religious or modern secular journey (Collins-Kreiner, 2010). Can pilgrimage be seen as touristic? Collins-Kreiner (2010) states that religious organizations and pilgrims do not consider pilgrimage as touristic, but from the industry's point of view pilgrims can be treated as tourists, and like any other sort of tourism, religious tourism has an impact on the economy of a destination in the form of income, profit and employment. We can ask ourselves what pilgrimage contributes to a local economy in terms of value added and employment, especially for those regions where pilgrimage is an important reason to visit.

In this article, Santiago de Compostela is used as an example. This city, located in the autonomous region Galicia in Spain, is visited every year by millions of tourists from all over the world. More than 200,000 of these tourists are pilgrims (The Confraternity of Saint James, 2016). As Lois-Gonzáles & Santos (2015:151) describe, the Way to Saint James and the destination Santiago de Compostela *". . . has become an attractive modern tourist destination for people seeking relaxation in the twenty-first century"*. Lopez *et al*. (2017) state that 'The Way' offers both the material (for example food and wine tasting) and immaterial (cultural, spiritual, and physical tourism) elements.

Tourism is an important source of employment for the region of Galicia. From 4% employment in tourism in 1991 to 10.6% employment in tourism in 2010 (Martinez-Roget *et al*., 2013), the share of tourism in the local economy has become more and more important. Besides religious and cultural tourism, such as pilgrimage, Galicia also profits from adventure, gastronomic, health & spa and sun & beach tourism (Martinez-Roget *et al*., 2013). For the city Santiago de Compostela itself, 33% of the visitors are pilgrims and 44% of the visitors are tourists (for holiday and / or leisure) (Fernández *et al*., 2016). However, increasing mass tourism to Santiago de Compostela can negatively affect the cultural and historical purpose of the city and the pilgrimage experience (Fernández *et al*., 2016; Blom *et al*., 2016). According to Blom *et al*. (2016) this causes other destinations to be alternative destinations for pilgrimage routes. Fisterra, for example is a destination that is becoming more popular.

As there is still room for the growth of pilgrimage in the region of Galicia, it is interesting to estimate its economic value. Therefore, this research analyses the economic impact of the expenditures of pilgrims on the regional economy of Galicia. The outcomes are relevant for stakeholders involved with pilgrimage, such as policymakers, government agencies, local authorities, project developers, and tourism businesses. Although the difference between pilgrims and 'general' tourists seems small, it is still useful to analyse pilgrims separately. As Lois-Gonzáles & Santos (2015) describe, there is a difference in the type of accommodation, spending, and number of days they stay.

Klijs and Korteweg Maris (2013) state that there are several types of economic impacts, of which the following four are, in general, of most interest:

- Output: the total value of products and services that are sold
- Value added: output minus expenditures on intermediary purchases
- Income: part of the total value added that is spent on salaries
- Employment: the number of jobs created

In this article, we used the Input Output model (I-O model) to calculate the impact of pilgrimage on gross value added (GVA) and employment. The impact on output is not included because it leads to double counting of intermediary output (Klijs & Korteweg Maris, 2013), while gross value added (the total of payments to capital and labour) is regarded as a more complete indicator than solely the payment to labour (income). Multipliers are used to show the effects for every euro of pilgrim expenditure (Heijman & Schipper, 2010).

The next section contains the literature review. The methodology section explains the choice of the I-O model, the steps in the application, and the required calculations. Following that, the results will be presented for GVA and employment. The final sections are the conclusion and discussion.

Literature study

Religious tourism can be an important source of income for a region. Holy sites are often surrounded by souvenir shops, hotels, and travel agencies. These businesses create impacts like population growth, job creation, and the development of infrastructure (Terzidou *et al*., 2008).

The literature discusses several examples of regions that obtained great economic benefits from religious tourism. One example is Saudi Arabia, where annually around 3 million take the Hajj, the Islamic pilgrimage to Mecca. Religious tourism is, besides oil, one of the major motors of its local economies (Rotherham, 2007; Saayman *et al*., 2013). In the United Kingdom, the small village of Epworth benefits from religious tourism due to it being the birthplace of John Wesley, the founder of Methodism. The hundreds of thousands of tourists visiting the village were an important source of income while the region was in economic decline. Another example from the United Kingdom is York; the tourism economy of the city is worth £250 million per year and supports 9,000 jobs, partly thanks to York Minster Cathedral which receives 1.6-2.2 million visitors per year (Rotherham, 2007). Lourdes, in France, has a growing population ever since it started receiving pilgrims in 1858. This population growth did not occur in the other cities of this area of the Pyrenees that were no particular place for pilgrimage. In Czestochowa, Poland, there has been a clear improvement of infrastructure since it started being visited by pilgrims (Terzidou *et al*., 2008).

Terzidou *et al*. (2008) conducted a study about the residents' perceptions of religious tourism and its socio -economic impacts on the Island of Tinos, Greece. Most residents see religious tourism as a positive contributor to employment opportunities, wages, and personal income. Most of them also believe that religious tourism has a negative influence on the prices of goods, land, and residential property. Traffic and congestion are seen as the major negative impacts. Saayman *et al*. (2013) discuss the regional economic impact of pilgrimage in the province of Limpopo, South Africa. Annually, nearly a million people go to the Easter weekend meeting of the Zion Christian Church. After an economic impact analysis based on surveys and a Computable General Equilibrium[1] (CGE) model, they concluded that the effects are rather small. The total production multiplier for the Limpopo region is 1.17. According to Saayman *et al*. (2013), this low value is due to a large percentage of the visitors being locals, limited expenditure by pilgrims, and the structure of the local economy. Besides the industries directly related to tourism (trade & communication and transport & communication), financial and business services benefit most from the expenditures of pilgrims.

Based on these examples, pilgrimage in Santiago de Compostela can be expected to have a substantial impact on the local economy. To the best of our knowledge, there is not yet a study that attempts to measure these impacts for this region. Studies do exist that discuss the impact of tourism on Spain in general and on some of its regions, including Galicia. Blake (2000) used a CGE model to analyse the impact of tourism in Spain. He concludes that a substantial increase in tourism expenditure itself does not cause a gain in welfare. Extra tourist expenditures do, however, increase the productivity of labour and capital. An important consideration for our research is the fact that the CGE model can be an appropriate tool for analysing the impacts of changes (e.g. the impact of changes in tourism expenditure) but it does not assess the importance or significance of tourism in numbers and proportions (of GDP for example), at a specific moment. I-O and social accounting matrix (SAM) - based multiplier models are more suitable to use for this type of analysis.

The importance of tourism for Galicia is researched by Carrascal Incera (2013). Using the SAM-based multiplier model, he assessed the economic significance of foreign and national inbound tourist consumption for 2008 in Galicia. 5.85% of the GVA of Galicia is related to tourism. For foreign inbound tourism, the multipliers are large in the transport and accommodation services. For national inbound tourism, real estate activities, and other services have relatively large multipliers. In general, the industries that are strongly linked to tourism (accommodation, hotels and restaurants, transport, rental services, and food and beverages products) have the largest total multipliers.

Martinez-Roget *et al*. (2013) studied the economic impact of academic tourism in Galicia. The three universities attract hundreds of foreign students every year, whose mobility can be seen as a new type of tourism. For the economic impact analysis, Martinez-Roget *et al*. (2013) used the I-O model to calculate the direct and indirect impact of the expenditures of these students. The largest parts of expenditure occur in the education, accommodation and food industries. The expenditure of foreign students led to an average multiplier of 1.43; every euro spent by foreign students in Galicia generated €0.43 of indirect impact in the region. A comparable multiplier was found by Carrascal Incera *et al*. (2013). They found a multiplier of 1.48 for tourist expenditure in the regional economy of Galicia in 2007 using an I-O model.

Another interesting study discusses the impact of tourism on local budgets in Spanish municipalities. Voltes-Dorta *et al*. (2014) state that for municipalities with between 50,000 and 250,000 residents - that are not provincial capitals - tourism is beneficial for the financial autonomy of the municipalities. It helps lower deficits and reduces debts. For smaller or larger municipalities, tourism has a negative impact on their financial situation, as the expenditures to accommodate tourism exceed the revenues. Santiago de Compostela has a population within the 50,000 and 250,000 range, but it is also the provincial capital of Galicia. Based on the conclusions of Voltes-Dorta *et al*. (2014), a large positive impact within the public sector is not expected.

These findings in literature indicate that in the economic impact analysis of this research a multiplier of around 1.43-1.48 (Incera *et al*., 2013; Martinez-Roget *et al*., 2013) can be expected. Also, the largest impact of pilgrimage will probably be in the industries that are closely related to tourism (accommodation, hotels and restaurants, transport, rental services, and food and beverages products). Besides these sectors, other industries related to financial services and real estate are likely to benefit most from pilgrimage. The public sector is not expected to benefit much.

Method

The impacts of tourist expenditure on output, GVA, income, and employment can be found by using an economic impact analysis (EIA). This analysis calculates the direct and indirect economic impact related to (changes in) expenditures (Klijs & Korteweg Maris, 2013). This paper analyses the impacts of tourism at a specific moment (an 'importance' or 'significance analysis') rather than the impact of a change, making an I-O model an appropriate tool.

1. A Computable General Equilibrium model is a model that does not operate under the assumption of no scarcity of production factors. It is able to simulate and calculate impacts of shocks like tax changes or exogenous demand changes within the whole economy. The model can be seen as an extension of an I-O model (Klijs, 2016).

There are several models that can be used to calculate direct and indirect economic impacts. Besides the I-O model, well-known models are the Export Base Model, Keynesian Model, Archer's Ad Hoc Model and the CGE Model (Klijs, 2016). Every tool has advantages and disadvantages, but Klijs & Korteweg Maris (2013) state that the I-O model can be considered as an appropriate compromise between simpler and more advanced models. The advantages, described by Klijs (2016), are important reasons to choose an I-O model for this study:

- The calculations can be done with standard software like MS excel, and the results can be understood by non-experts in the field of EIA. This model is in contrast to the CGE model, which requires specialized software and more mathematical and economic knowledge;
- The I-O model is commonly used in scientific research. The way it must be applied and interpreted as well as its advantages and disadvantages are well -described;
- The most important data required for the model can easily be obtained. I-O tables can be found via Eurostat, OECD and/or regional databanks;
- The model enables a calculation of indirect impact on income, value added, and employment.

There are however disadvantages that should be taken into account (Klijs, 2016):

- The relevant level or change of final demand must be determined by the researcher, by collecting data or making assumptions;
- An I-O table is not available on every spatial scale. Region I-O tables can be created, but this requires making further assumptions;
- The model is based on a few strong assumptions, such as 'no scarcity of production factors'. The model does not take into consideration relative price changes, input substitution and redistribution of production factors among industries. This condition implies, among other things, that there is a linear relation between increase in output and increase in employment. This limitation is however only relevant when the I-O model is applied in an impact analysis, rather than a significance analysis;
- The I-O model shows the impact on the region but not how the impact is distributed within the region. In this research, it could be that the economic impact is larger close to the routes to Santiago de Compostela compared to places more remote from the city and its routes;
- The I-O model does not take into consideration social or environmental impacts or economic externalities.

For the remainder, these disadvantages need to be kept in mind. The assumptions required to create an I-O table and determine final demand and the assumptions underlying the I-O model imply that the impacts are only estimations.

The first step in applying the I-O model is to choose an appropriate spatial scale (Klijs & Korteweg Maris, 2013). In this research, the NUTS classification is applied. Eurostat, the statistical database of the European Commission, has developed this NUTS classification for different regions in the European Union's territory (Eurostat, 2013). A lot of relevant data (value added, employment, output per industry and I-O tables) are available for each NUTS region. NUTS 0 is the level of a country, which is then divided into NUTS 1 regions, the major economic regions. Subsequently, these NUTS 1 regions are divided into NUTS 2 and then NUTS 3 regions (Eurostat, 2013). Santiago de Compostela lies within:

- NUTS 0 region 'España', ES
- NUTS 1 region 'Noroeste', ES1
- NUTS 2 region 'Galicia', ES11
- NUTS 3 region 'A Coruña', ES111

NUTS 2 region 'Galicia'; ES11, where all routes come together in Santiago de Compostela, is the region to which the impact analysis is applied. A smaller spatial scale is less attractive because most of the pilgrimage expenditures are done along the routes. 'The Way' to Santiago de Compostela is the major experience and often the purpose of the journey (Lois-González & Santos, 2015; Lucarno, 2016; Lopez *et al.*, 2017). Most of the spending is done along the route (Lucarno, 2016). The larger spatial scale of NUTS 1 region 'Noroeste', ES1 is also less suitable. Besides, including NUTS 2 region 'Galicia', ES11, it also includes the NUTS 2 regions ES12 and ES13, where only one or two routes are represented. Appendix 1 shows a map of the division of NUTS levels in Spain, and Appendix 2 shows a map of all routes to Santiago de Compostela and the borders of the provinces, which roughly reveals through which NUTS regions the routes pass. To conclude, the I-O model is applied on the NUTS 2 level 'Galicia'.

Unfortunately, a complete I-O table for 'Galicia' is not available. This table can however be estimated using the national I-O table and the regional economic accounts of the NUTS 2 region (Eurostat, 2013; Klijs & Korteweg Maris, 2013). The most recent national I-

O table from 2010 for domestic production was obtained from the Spanish national data bank 'Instituto Nacional Estadistica' (2016). Before regionalizing the table, the number of industries was reduced (Groeneveld, 2011). The table is compressed to seven industries, which are based on the NACE Rev. 2 statistical classification of economic activities. Much of the required data are available at this level of aggregation (Eurostat, 2008). The seven industries are:

- Agriculture, Forestry and Fishing (including Mining)
- Industry and Manufacturing
- Construction (and Construction Works)
- Services
- Wholesale and retail trade, hotels and restaurants, transport (which will be abbreviated to Retail and Travel Services)
- Financial and Real Estate Services
- Public administration and community services (abbreviated to Public and Health Services)

Appendix 3 shows which sub-industries are aggregated into each of the seven industries. Appendix 4 shows the compressed national I-O table.

As will be explained in more detail later, only the total expenditure of the pilgrims, not the expenditure per industry, is known. As most of their spending is in the industries related to tourism, retail and transport, their final demand was entered into the compressed industry 'Retail and Travel services'. The I-O table is in basic prices, so the trade and transport margins, import rates, and net taxes on products were subtracted (Klijs, 2016). This is done by following the example of Klijs *et al*. (2016b) where an average percentage is calculated for direct imports (expenditure on goods that are bought in Galicia but not produced there) and net taxes - based only on those industries that are likely to be relevant for tourism. For example, it is unlikely that tourists or pilgrims buy products from the 'Mining and Quarrying' industry, but they most likely will buy products from 'Textile, Wearing Apparel and Leather Products'. Trade and transport margins were not corrected for, because the impulse of pilgrimage expenditures is assigned to the 'Retail and Travel Services' industry , which includes transport and trade. The percentages of both import rates and net taxes is subtracted from the total estimated expenditures of pilgrims. The calculation of the total expenditures will be discussed later in this section.

A regional I-O table can be derived from the national I-O table using Location Quotient Methods (Klijs & Korteweg Maris, 2013; Heijman & Schipper, 2010). These methods use the relative size of the industries within a regional economy compared to the size of the industries in the national economy to estimate the technical coefficients for a region. There are several methods to calculate regional technical coefficients. The four most discussed in literature and used in empirical applications are the Simple Location Quotient (SLQ), Cross Industry Location Quotient (CILQ), Round's Location Quotient (RLQ) and Flegg's Location Quotient (FLQ) (Klijs *et al.*, 2016a; Flegg & Tohmo, 2013; Kowalewksi, 2013). The SLQ is based on the sizes of supplying industries and the size of region, while the CILQ is based on the relative sizes of supplying and demanding industries. The RLQ is more complete in the sense that it takes into account the relative sizes of supplying and demanding industries and the size of the region, but the manner in which regional size is included is rather 'implicit and obscure' (Flegg & Webber, 1997). Also, the FLQ takes into account the relative sizes of the demanding and supplying industries and the size of the region, and a correction is made to avoid overestimation that is inherent in the other location quotient methods (Bonfiglio, 2005; Kowalewksi, 2013).

Depending on the relationship between the output of the demanding industry j on the regional level, relative to the output of the demanding industry j on the national level (J) and the regional output relative to the national output (S), which location quotient methods will give us the largest or smallest regional technical coefficients can be determined (Klijs *et al.*, 2016a). For all combinations of sectors where $J > S$, the SLQ will produce the largest regional technical coefficients, while the FLQ (which was developed to avoid overestimation) is likely to lead to the lowest regional technical coefficients for many combinations of demanding and supplying sectors (for the exact conditions, see Klijs *et al*. 2016a). In this article the SLQ and FLQ are used because these will give us a broad estimation of the impact.

The SLQ formula is as follows (Klijs, 2016):

$$SLQ_i = \frac{\frac{x_i^R}{x_i^N}}{\frac{x^R}{x^N}} \quad \textbf{(1)}$$

The x stands for output, R for regional, N for national and i for industry i. If $\boldsymbol{SLQ_i}$ is equal or greater than one, it is assumed that supplying industry i is sufficiently present in a region to fulfil the demand for intermediary goods by all demanding industries. In this case, the regional technical coefficient is equal to the national technical coefficient. If $\boldsymbol{SLQ_i}$ is less than one, it is assumed that industry i is not sufficiently located within the region and imports are required from other regions. The regional technical coefficient is computed by multiplying the SLQ by the national technical coefficient (Heijman & Schipper, 2010; Klijs *et al.*, 2016a).

The FLQ has a more complex formula. It is based on the CILQ and a weighting parameter δ (Klijs *et al.*, 2016a):

$$FLQ_{ij} = CILQ_{ij} \cdot \lambda^* \qquad \textbf{(2.1)}$$

$$CILQ_{ij} = \frac{x_i^R / x_i^N}{x_j^R / x_j^N} \qquad \textbf{(2.2)}$$

$$\lambda^* = [Log_2\left(1 + {x^R}/{x^N}\right)]^{\delta}, \;\; (0 \leq \delta < 1) \qquad \textbf{(2.3)}$$

In the FLQ formula, the CILQ is multiplied by **λ*** , which is related to the regional size. Parameter δ is a weighting parameter for the size of the region, of which the exact number must be determined based on empirical research on the specific region (Kowalewksi, 2013; Flegg & Tohmo, 2016; 2010). Flegg & Weber (1997) found that δ = 0.3 seems reasonable for regions in Scotland and Peterborough. Some studies have undertaken research in the states of Punjab in India and Oaxaca in Mexico using the FLQ formula with δ = 0.3 (Singh & Singh, 2011; Rodriguez & Cruz Ramirez, 2009). In a later study, Flegg and Tohmo (2011) showed that δ = 0.25 was more accurate for regions in Finland, while Kowalewksi (2013) found a value of 0.11 < δ < 0.17 for the German Federal State of Baden-Wuerttemberg. Flegg and Tohmo (2016) state that it is important to choose the correct value of δ to obtain accurate estimations for impact analysis. For the region of Galicia, the correct δ has not been researched as yet; therefore a sensitivity analysis is used for these values. The FLQ is calculated using three different values of δ that are close to the common values found and used in literature as described above; δ = 0.2, δ = 0.25 and δ = 0.3.

For both the SLQ and FLQ, the regional and national output per industry ($\boldsymbol{x_i}$) are replaced with employment per industry. Figures on output per industry are not available for Galicia. Using the SLQ and FLQ, the matrices containing the regional technical coefficients can be obtained. These matrices are used in the Leontief equation (Heijman & Schipper, 2010):

$$\boldsymbol{\Delta X = (I\text{-}A)^{-1} \Delta F} \qquad \textbf{(3)}$$

In this equation ΔX is the change in output, I is the unity matrix (in our case a 7 by 7 matrix, as there are seven industries), A is the matrix of technical coefficients and ΔF is the change in final demand. The Leontief inverse $(I\text{-}A)^{-1}$ contains the multipliers. The sum of each column of the Leontief inverse shows the total impact of an impulse of €1 in the industry to which that columns relates, i.e. the total multiplier for that industry. If the sum of a column is 1.40 then an impulse of €1 generated an effect of €1.40 (Heijman & Schipper, 2010). The total multiplier can be split into the multiplier for the industry in which the impulse is given and the spillover multiplier, which represents the effect on the remaining part of the industry. The impulse in this analysis, specifically the total expenditures of pilgrimage, is assigned to the industry 'Retail and Travel Services'*,* so that the total multiplier can be split between the multiplier within this industry and the spillover multipliers to other industries.

The next step is to estimate the change in final demand (the impulse in the I-O model), which is the expenditure of pilgrims. First, the expenditure by pilgrims during their stay in Galicia was estimated. According to Lois-González & Santos (2015), the spending of pilgrim tourists on route to Santiago de Compostela is different than normal tourist spending. They spend much less, because on the Way to Santiago de Compostela they stay in hostels and churches, which are cheaper than hotels for tourists. Also, while walking, pilgrims do not spend as much on shopping and souvenirs because of the limited weight they can carry while walking. On the Way to Saint James, they spent on average (in 2010) €31 euros per day per person (Lois-González & Santos, 2015), which is significantly less than average tourist spending. It is not known how this expenditure is divided over industries - hence the choice to allocate all expenditures to 'Retail and Travel Services'.

Using travelling websites specialized in the Way to Santiago de Compostela, the estimated time needed for pilgrims to walk to Santiago de Compostela from the boarder of Galicia is approximately 6.5 days (Corrigan, 2016). In the city Santiago, they stay on average 1.35 days (Lois-González & Santos, 2015) and then they travel through Galicia for approximately 7 days (Instituto Nacional de Estadistica, 2016). Lucarno (2016) mentions that most of the expenditures are distributed uniformly along the route. Lois-González & Santos (2015) state that on average they spend €31 per day , which makes a total of €460.35 for their stay in Galicia. This sum is significantly lower than what normal tourists would spend. As this value is a rough estimation, a sensitivity analysis is applied here too: not only the impact of an impulse of €460.35 was calculated, but also the impact of a smaller (€400) and larger impulse (€500). All data used are from the year 2010.

The total impulse was calculated by multiplying the expenditure of €400, €460.35 and €500 by the 272,135 pilgrims that visited Galicia in 2010 (The Confraternity of Saint James, 2016). As the number of pilgrims in 2010 is comparable with the number of pilgrims in 2016 (277,915) and the I-O tables in Eurostat are available up until 2011, the year 2010 is chosen. The impulses were corrected for direct import rates and net taxes, leaving us with a total small impulse of €96.90 million, a total average impulse of €111.52 million and a large total impulse of €121.12 million.

The last step is to calculate the impacts. The total economic impact can be calculated by multiplying the impulse by the total multiplier for 'Retail and Travel Services'. The result shows the total impact on the output. In the absence of data on productivity per sector in Galicia, it can be assumed that national output / GVA and output / employment ratios also apply for Galicia. Using these ratios per aggregated sector, the impact on GVA and employment for Galicia can be calculated.

Results and Discussion

By calculating the Leontief Inverse, the multipliers were obtained. This research is particularly focussed on the multiplier of 'Retail and Travel Services'. In the table below, the multipliers for this sector per LQ method are shown.

Table 1: Multipliers for the industry 'Retail and Travel Services' in 2010 per LQ method

	Multiplier
SLQ	1.65
FLQ; δ = 0.2	1.25
FLQ; δ = 0.25	1.20
FLQ; δ = 0.3	1.16

Table 1 shows that the multiplier for this industry in Galicia is 1.65 based on the SLQ and between 1.16 and 1.25 based on the FLQ. This implies that a €1 impulse in the 'Retail and Travel Services' generates an impact of €1.65 (SLQ) or between €1.16 and €1.25 (FLQ) on output within the whole region of Galicia. This multiplier is the sum of the multiplier within its own industry and the spillover to other industries. For example, for the 1.65 multiplier, 1.19 is the impact within 'Retail and Travel Services' itself and the remaining part is divided over the other industries. Between the different values of weighting parameter δ of the FLQ, the total multiplier varies by no more than 0.10, and within the industries the difference is no higher than 0.03. Industries that benefit most from a €1 impulse in 'Retail and Travel Services' are 'Industry' (0.194 SLQ; 0.056 FLQ δ=0.25) and 'Services' (0.118 SLQ; 0.035 FLQ δ=0.25). The difference between the FLQ (and its different values of δ) and SLQ on the impact is shown in the following table.

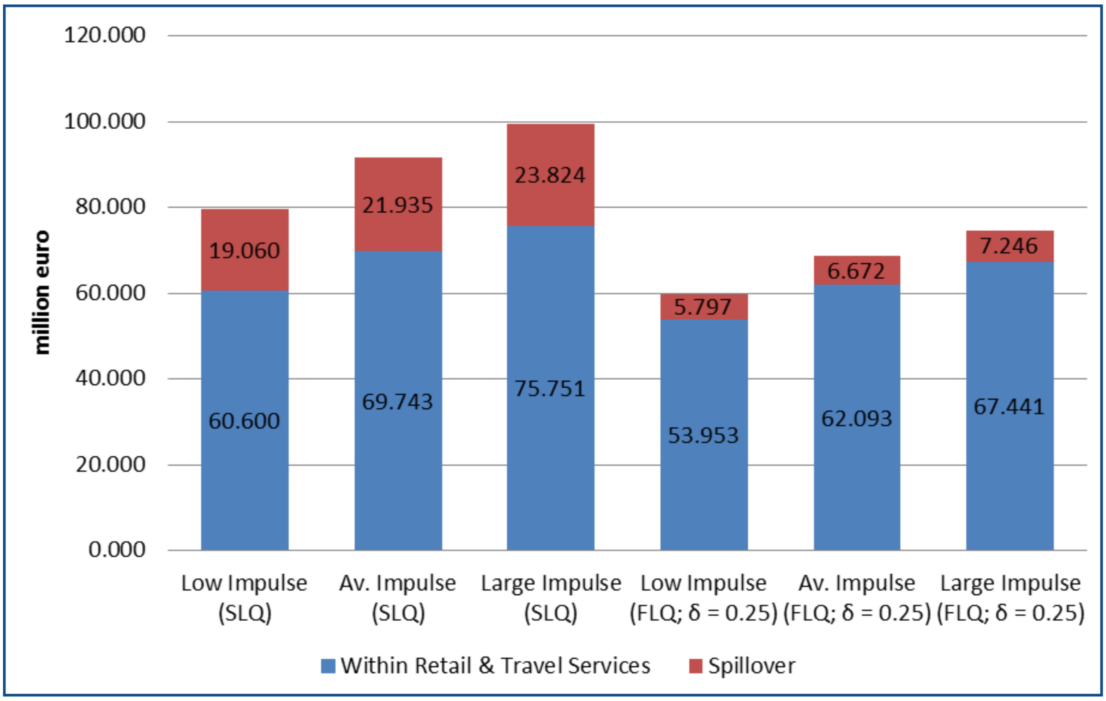
Table 2: Total impact in 2010 (in millions of euro's) on output in Galicia per impulse per LQ method

	FLQ			SLQ
	δ = 0.2	δ = 0.25	δ = 0.3	
Low Impulse	121.334	116.376	112.555	159.610
Average Impulse	139.640	133.934	129.537	183.691
High Impulse	151.668	145.470	140.694	199.512

Between the different values for δ, there is a difference of no more than €11 million in terms of impact on total output. Both Table 1 and 2 show that the smaller the weighting parameter is (less correction for overestimation), the larger the total impact will be.

Multiplying the impact on outputs per sector by the national GVA / output ratio per sector gives us the impact on GVA for the region of Galicia. Figure 1 below shows the impact on GVA per type of impulse for the SLQ and FLQ. The impacts are divided into the impact within 'Retail and Travel Services' and the total spillover impact for the other industries. For example, the total impact on GVA based on the SLQ with a

Figure 1: Impact (in millions of euro's) in 2010 on GVA per impulse per LQ method within the 'Retail and Travel Services' industry itself and its spillover



small impulse is an impact of €60.600 million within 'Retail and Travel Services' plus €19.060 million spillover impact, which is €79.660 million in total

The total impact of pilgrimage on GVA is between €59.750 million (low impulse FLQ, δ=0.25) and €99.575 million (large impulse SLQ). Most of this impact, specifically between €53.953 (low impulse FLQ, δ=0.25) and €75.751 million (large impulse SLQ), is generated within 'Retail and Travel Services' itself.

How the impact on GVA is divided over the industries is shown in Table 3. The largest spillover effect is in 'Industry and Manufacturing', namely between €5.640 and €7.050 million based on the SLQ and between €1.615 and €2.019 million based on the FLQ. The 'Financial Services and Real Estate' industry has a spillover of between €5.420 and €6.775 million (SLQ) or between €1.768 and €2.210 million (FLQ). In third place comes 'Services', with a spillover of between €5.372 and €6.715 million (SLQ) or between €1.571 and €1.964 million (FLQ). The remaining industries have substantially smaller spillovers. The impacts based on the FLQ with δ=0.2 and δ=0.3 vary no more than €2 million from the values in Table 3 for the sector 'Retail and Travel Services' and no more than €1 million for the other sectors.

Table 3: Impact on GVA in 2010 (in millions of euro) per industry, per LQ method and for low and large impulse

	SLQ		FLQ; δ = 0.25	
	Low Impulse	Large Impulse	Low Impulse	Large Impulse
Agriculture, Forestry, Fishing	0.798	0.997	0.300	0.375
Industry and Manufacturing	5.640	7.050	1.615	2.019
Services	5.372	6.715	1.571	1.964
Constructions	0.909	1.136	0.243	0.304
Retail and Travel Services	60.600	75.751	53.953	67.441
Financial and Real Estate Services	5.420	6.775	1.768	2.210
Public and Health Services	0.921	1.151	0.299	0.374

Figure 2: Impact on employment in 2010 (in number of people active in productive activities in the economy of Galicia between an age of 15 to 65) per impulse per LQ method within the 'Retail and Travel Services' industry itself and its spillover

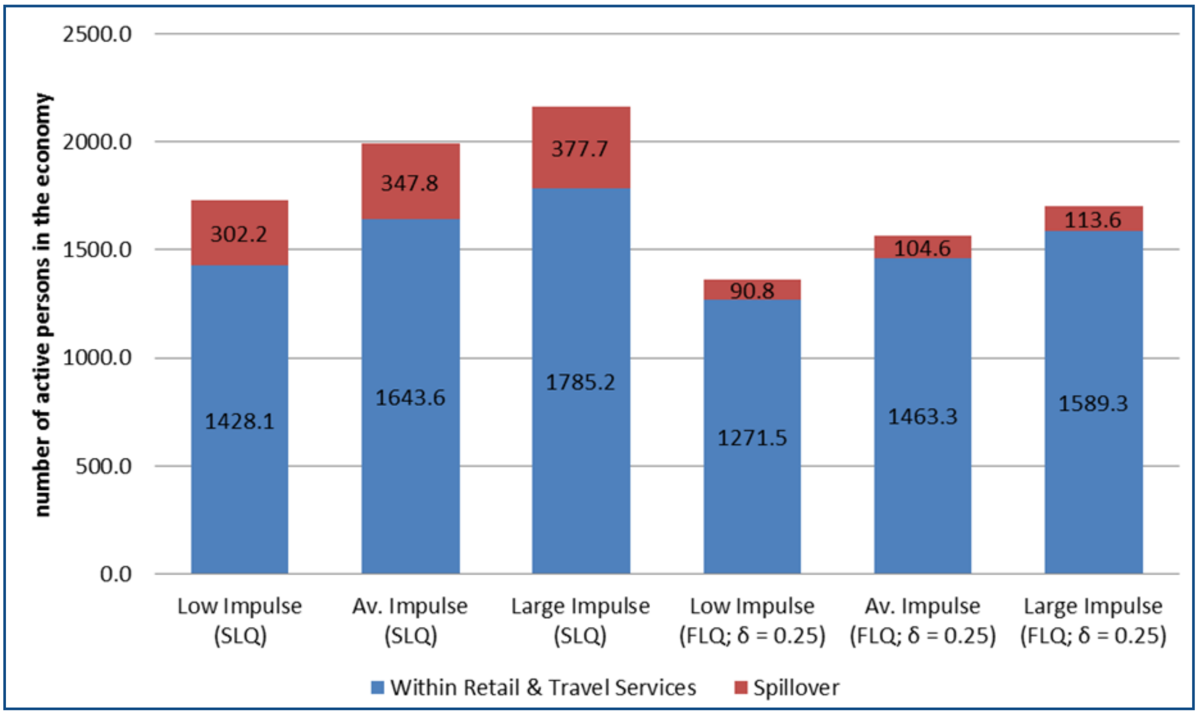


Figure 2 shows the impact on employment. The data on employment per industry in Galicia available in Eurostat defines employment as the number of people active in productive activities in the economy of Galicia between the ages of 15 to 65 (Eurostat, 2016). More detailed employment data, for example the number of full time jobs, is not available per industry in Galicia. By multiplying the impact on the outputs by the national employment/output ratio, the impact of pilgrimage on the employment of Galicia was calculated. The impulse of the expenditure of pilgrims generates between 2162.9 (large impulse SLQ) and 1362.3 (low impulse FLQ) active people. Important to note is that the definition of employment as used by Eurostat is rather broad. Employment defined as the number of full time jobs or in FTE's would give a better indication of the actual impact on employment.

The division of the spillover impact on employment between the industries is shown in Table 4. Within 'Retail and Travel Services' itself, the impact is again the largest, i.e. between 1271.5 (FLQ) and 1785.2 (SLQ). For the sector 'Industry and Manufacturing', the spillover is between 87.9 and 109.9 based on the SLQ and between 25.3 and 31.5 based on the FLQ. The spillover in 'Services' is higher. For the other

Table 4: Impact on employment in 2010 (in number of people active in productive activities in the economy of Galicia between an age of 15 to 65) per industry, per LQ method and for low and large impulse

	SLQ		FLQ; δ = 0.25	
	Low Impulse	Large Impulse	Low Impulse	Large Impulse
Agriculture, Forestry, Fishing	24.8	31.0	9.3	11.7
Industry and Manufacturing	87.9	109.9	25.2	31.5
Services	131.0	163.8	38.3	47.9
Constructions	17.2	21.4	4.6	5.7
Retail and Travel Services	1428.1	1785.2	1271.5	1589.3
Financial and Real Estate Services	21.1	26.3	6.9	8.6
Public and Health Services	20.1	25.2	6.5	8.2

industries, the spillover of employment is rather small. The differences between the impacts on employment for the different values of δ is no larger than 100 for the 'Retail and Travel Services' sector and no larger than 28 for the other sectors.

The results show significant impacts on the local economy of Galicia, but some caution has to be taken. Important to keep in mind are the various assumptions underlying this study affecting the accuracy of the impact estimates. To begin with, the research is based on a rough estimation of the expenditures of pilgrims in Galicia. Fernández *et al.*. (2016) mention that it is more common that pilgrims, once they reach Santiago, start behaving like regular tourists implying that the impact may be underestimated. The calculation of the regional technical coefficients depends on the assumptions made in the SLQ and FLQ. Doing the same impact analysis with an actual I-O table of Galicia could give us more precise estimates, as there is no need to do estimations using location quotients and as more details regarding the exact direct import rates and net taxes could be determined.

All information used (I-O tables and other datasets from Eurostat, expenditures of pilgrims, number of pilgrims) are based on the year 2010. The analysis therefore estimates the impact based on data from seven years ago. However, IO tables are generally not available for the four most recent years. The year 2010 was a Holy Year. In that year many more pilgrims visited Galicia compared to the years before and right after. However, because of the rising numbers of pilgrims to Santiago de Compostela, in the year 2016, the number of pilgrims (277,915) is comparable with the number in 2010. Under the assumption that their expenditure has not changed substantially, the outcomes of this research can therefore also be seen as an indication for the impacts in 2017 – taking into consideration an 8.2% inflation in Galicia between 2010 and 2017. The impact of pilgrimage on the total GVA in 2010, would now be between €64.649 million and €107.740 million, when corrected for inflation.

Conclusion

In this paper, Economic Impact Analysis has produced a range of estimates for two measures of the regional economic impact of pilgrimage to Santiago de Compostela in the NUTS 2 region Galicia in 2010 using the I-O model. The economic impact is estimated in terms of GVA and employment. To obtain a broad estimation, the I-O model is applied using both the SLQ and FLQ. The total multiplier for the 'Retail and Travel Services' sector of Galicia that came out of the I -O model is between 1.16 and 1.25 (FLQ, δ=0.20 and δ=0.30) and 1.65 (SLQ). The multipliers found for tourism in other studies (1.43 and 1.48) fall within this range (Incera *et al*., 2013; Martinez-Roget *et al*., 2013).

The range of the multiplier is broad, also creating large differences in the range of the impact on GVA and employment found in the analysis. In the most conservative situation of this analysis, pilgrimage expenditures in 2010 caused an impact of €59.750 million on the total economy of Galicia and an impact of 1362.3 extra people engaged in productive activities in Galicia. However, if the pilgrims spend €500 on their journey the impact on GVA goes up to €99.575 million and the impact on employment is 2162.9. For both GVA and employment, this research shows that especially for the 'Retail and Travel Services' industry, pilgrimage is responsible for a significant impact. As expected from the literature review, the 'Services' and 'Financial and Real Estate Services' sectors benefited from the impact, and for the 'Public and Health Services' sector the spillover was small.

Coming back to the relevance for stakeholders involved with pilgrimage, such as policymakers, government treasuries of local authorities, project developers and tourism businesses, the impacts obtained with this analysis gives an indication of the impact of pilgrimage on the local economy of Galicia. Although the estimations are rough, the range is wide, the estimations suggest that the impact on the local economy is substantial, even in the most conservative scenario. For these stakeholders and even other sectors that are not related to religious tourism, but do benefit from the growth of this sector, this might be an argument to further invest in religious tourism.

A concrete example of the relevance of this type of research is mentioned by Santos Solla (2006), namely that changing the routes of pilgrims to Santiago de Compostela could be beneficial for the less economically developed regions. If the regional multipliers for the NUTS 3 regions within Galicia could be obtained, it could be determined in which regions it is useful to change the routes. Further research on the economic impact of pilgrimage on a smaller spatial scale could provide policymakers with the fundamental arguments to decide whether changing routes could work well for the local economy.

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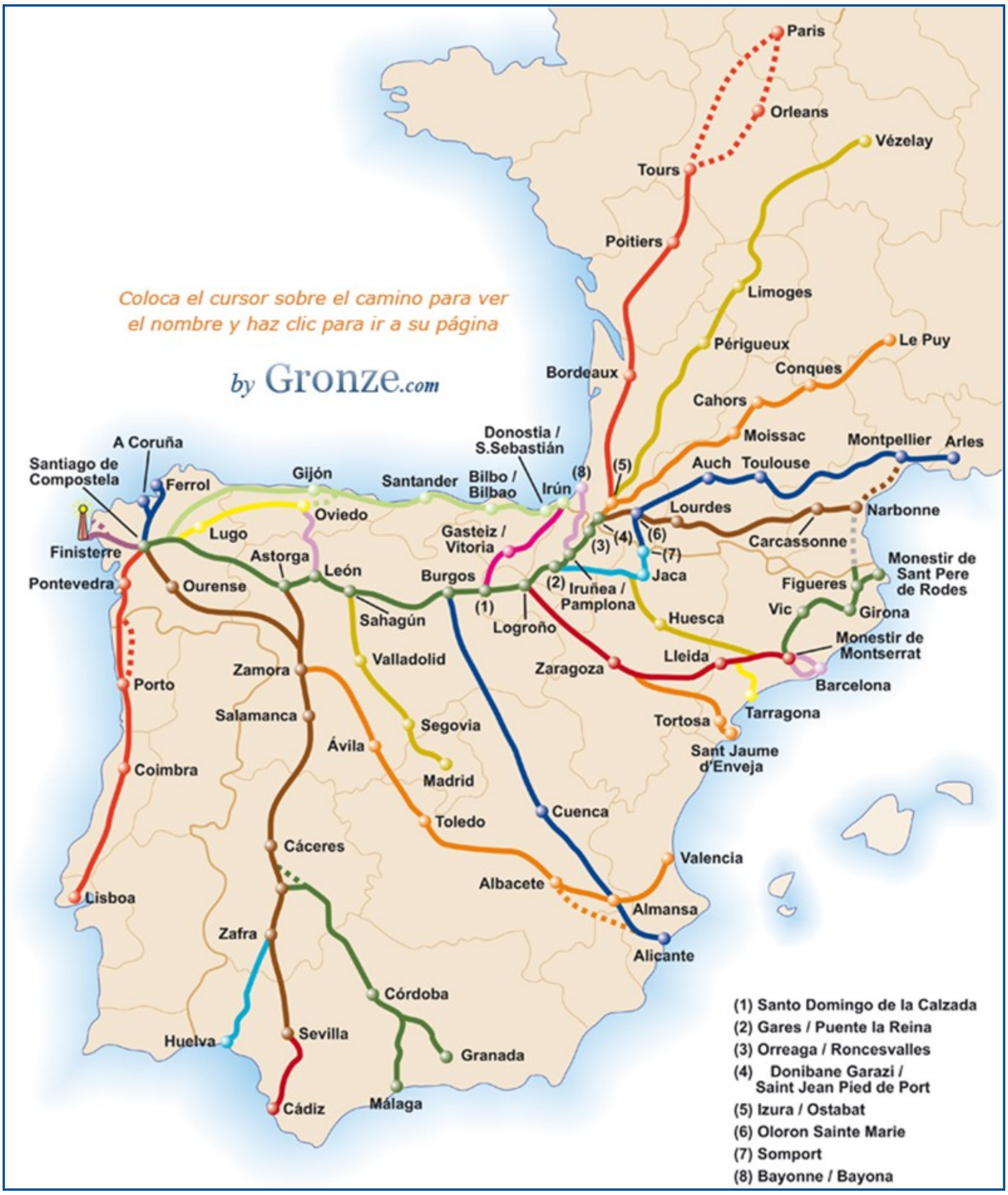
Appendix 1: Map NUTS 2 regions Spain

Source: Eurostat (2013)

Appendix 2: All pilgrimage routes to Santiago de Compostela, with an indication of the borders of the provinces



Source: 2016, Thedancingpilgrim.files.wordpress.com

Appendix 3: Components of Each Industry Sector

	Agriculture, Forestry and Fishing
1	Products of agriculture, hunting and related services
2	Products of forestry, logging and related services
3	Fish and other fishing products; aquaculture products; support services to fishing
4	Mining and quarrying
	Industry and Manufacturing
5	Food products; beverages; tobacco products
6	Textiles; wearing apparel; leather and related products
7	Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials
8	Paper and paper products
9	Printing and recording services
10	Coke and refined petroleum products
11	Chemicals and chemical products
12	Basic pharmaceutical products and pharmaceutical preparations
13	Rubber and plastics products
14	Other non-metallic mineral products
15	Basic metals
16	Fabricated metal products, except machinery and equipment
17	Computer, electronic and optical products
18	Electrical equipment
19	Machinery and equipment n.e.c.
20	Motor vehicles, trailers and semi-trailers
21	Other transport equipment
22	Furniture; other manufactured goods
23	Repair and installation services of machinery and equipment
24	Electricity, gas, steam and air conditioning
25	Natural water; water treatment and supply services
	Construction
27	Constructions and construction works
	Retail and Travel Services
31	Land transport services and transport services via pipelines
32	Water transport services
33	Air transport services
34	Warehousing and support services for transportation
36	Accommodation and food services
52	Travel agency, tour operator and other reservation services and related services

	Services
26	Sewerage services; sewage sludge; waste collection, treatment and disposal services; materials recovery services; remediation services and other waste management services
35	Postal and courier services
37	Publishing services
38	Motion picture, video and television programme production services, sound recording and music publishing; programming and broadcasting services
39	Telecommunications services
40	Computer programming, consultancy and related services; information services
45	Legal and accounting services; services of head offices; management consulting services
46	Architectural and engineering services; technical testing and analysis services
47	Scientific research and development services
48	Advertising and market research services
49	Other professional, scientific and technical services; veterinary services
50	Rental and leasing services
51	Employment services
53	Security and investigation services; services to buildings and landscape; office administrative, office support and other business support services
58	Creative, arts and entertainment services; library, archive, museum and other cultural services; gambling and betting services
59	Sporting services and amusement and recreation services
60	Services furnished by membership organisations
61	Repair services of computers and personal and household goods
62	Other personal services
63	Services of households as employers; undifferentiated goods and services produced by households for own use
64	Services provided by extraterritorial organisations and bodies
	Financial Services and Real Estate
41	Financial services, except insurance and pension funding
42	Insurance, reinsurance and pension funding services, except compulsory social security
43	Services auxiliary to financial services and insurance services
44	Real estate services
44	of which: imputed rents of owner-occupied dwellings
	Public and Health Services
54	Public administration and defence services; compulsory social security services
55	Education services
56	Human health services
57	Residential care services; social work services without accommodation

Appendix 4: Compressed Input Output Table at Basic Spanish Prices

Compressed Input-output table. 2010

Unit: million euros

Homogeneous branches-IOT / Products-IOT		Agriculture, Forestry, Fishing, Mining	Industry and Manufacturing	Services	Constructions	Retail and Travel Services	Financial and Real Estate services	Public and Health Services	Total intermediate consumption	Final uses	Total use
					27						
Agriculture, Forestry, Fishing, Mining		1,733.5	28,623.1	342.8	717.0	2,125.8	18.6	205.3	33,766.1	17,011.5	50,777.6
Industry and Manufacturing		11,791.7	184,540.5	24,589.4	26,860.1	40,697.2	1,950.1	12,226.0	302,655.0	265,161.1	567,816.1
Services		1,650.6	35,028.1	67,349.3	13,169.6	34,142.6	11,734.8	14,449.0	177,524.0	152,353.1	329,877.1
Constructions	27	262.9	3,869.0	2,768.7	52,541.2	4,270.6	7,634.5	3,002.6	74,349.5	141,550.0	215,899.5
Retail and Travel Services		4,191.0	44,037.1	12,279.0	14,732.8	64,781.7	1,588.1	8,798.2	150,407.9	276,086.8	426,494.7
Financial and Real Estate services		720.5	8,891.6	15,141.0	7,573.0	31,830.0	25,935.1	4,116.1	94,207.3	125,601.8	219,809.1
Public and Health Services		109.3	2,274.4	2,463.6	472.1	3,656.6	207.4	5,596.1	14,779.5	212,861.4	227,640.9
Total at basic prices		**20,459.5**	**307,263.8**	**124,933.8**	**116,065.8**	**181,504.5**	**49,068.6**	**48,393.3**	**847,689.3**	**1,190,625.7**	**2,038,315**