THE ECONOMIC IMPACT OF A TOURIST TAX IN ANDALUSIA EXAMINED THROUGH A PRICE EFFECT MODEL

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ABSTRACT

The tourism industry is a key sector in the Andalusian economy; it accounts for 13% of the regional GDP and 14% of the employment. In 2019, 32.5 million tourists visited Andalusia, and the tourism sector generated 22.6 billion euros. In 2020, the year in which COVID-19 paralyzed the world, 13.4 million tourists visited Andalusia, which translated into 8,500 million euros of income. After this decrease in tourism in 2020, the total number of tourists for the year 2021 was 20 million, and the forecast for the year 2022 is 28 million tourists.

This article analyzes how to use a social accounting matrix (SAM) to empirically study the effects of such a price burden on the regional economy of Andalusia. The methodology that we use consists of a specific model of price effects, which analyzes the impact of introducing a tourist tax in Andalusia. The database used in the analysis is the Andalusian SAM, which was built using data from 2016. This study will enable us to better understand and reflect on the existing structural interdependence between the productive sectors and to evaluate the implicit weights and price elasticities of different tourist items.

Keywords: Input–Output Analysis, Applied General Equilibrium, Social Accounting Matrix, Price Effects Model, Tourism, Andalusia.

JEL Classification: C67, C68, D57, D58, E37, R13

1. Introduction

The existence or absence of tourist taxes in a specific destination is an issue of special relevance and controversy that has been on the table for years in certain regions of different countries. One of the clearest examples of such a location is the region of Andalusia. In fact, currently in Spain, there are only two autonomous communities with a tourist tax, namely, the Balearic Islands and Catalonia (López et al., 2018).

In relation to the first case, the misnamed tourist tax is configured as a tax on tourists' stays in accommodation establishments. It should be noted that in the Balearic Islands, ecotaxes are implemented with the aim of generating financial resources to improve the environmental crisis situation that is the result of impacts caused by tourism and with the goal of developing a more sustainable and resilient future for tourism (Bouazza, 2021). The collection of the tax on stays in tourist establishments for 2019, which was the year prior to the pandemic caused by COVID-19, totaled more than 130 million euros (Institute of Statistics of the Balearic Islands, 2021). However, the purpose of ecotaxes should not be to collect money but rather to gradually eradicate unsustainable uses and bad tourism practices that affect the environment. The case of Catalonia is different from that of the Balearic Islands, given that the objective of the Catalan administration is to maintain the autonomous community as a competitive and quality destination. The Generalitat allocates the proceeds of the tax to boost tourism promotion, the development of tourism infrastructures and the creation and improvement of tourism products. The tax collection on stays in tourist establishments for 2019, which was the year prior to the pandemic caused by COVID-19, totaled more than 53 million euros (Generalitat de Catalunya, 2020; 2021).

This paper is divided into four sections. After the introduction, we present the methodology on which the study is based. In section number three, we expound on the presentation of the simulations carried out and comment on the results obtained on the basis of these simulations. Finally, we reflect the main conclusions obtained on the basis of our research work.

2. Methodology

In empirical applications of general equilibrium theory, we can distinguish between Walrasian models (whose numerical implementations are known as computable general equilibrium -CGE- models) and SAM (social accounting matrix) models.

The database used in this model is a social accounting matrix (SAM), which was constructed for Andalusia (Delgado, 2020) from the input–output table published by the Institute of Statistics and Cartography of Andalusia (IECA) using data from 2016. This SAM is composed of 81 sectors that describe the flows carried out in the Andalusian economy for that year. The methodology was chosen over an input–output table because

the SAM allows for the homogenization and completion of microeconomic information on the circular flow of income, production and expenditure. That is, in addition to the productive sectors, the model identifies capital and labor as productive factors, it recognizes savings–investment accounts, it treats governments and consumers as institutional sectors, it disaggregates different taxes and finally, it includes external sectors. Therefore, by adopting this methodological approach, the interdependence between the different productive sectors can be clearly observed, and the possibility of evaluating the different weights and elasticities of the indirect taxes considered is opened up. It is important to highlight that for this quantitative economic study at the regional level, it is not necessary to update the available databases since they emanate from the latest input–output framework available for Andalusia. These frameworks are published every five years, as it is understood that there are no significant structural changes that occur in the economy during time periods of that length (Cañada, 1999).

Following Cardenete and Sancho (2002), the price model used is based on a linear general equilibrium model. The price formation rule distinguishes the formation of output prices in each productive sector. This is due to the characteristics of technology and the competitive behavior of firms. The production price p_j is defined as follows:

$$p_j = (1 + \tau_j)\left(\sum_{i=1}^{81} q_j\, a_{ij}\, (wl_j + rk_j + p_m\, a_{mj})\right)$$

where a_{ij}, l_j, k_j, and $y\ a_{mj}$ are the technical coefficients of the productive sectors, the labor factor, the capital factor and the external sector, respectively. Furthermore, rk_j is the payment for using capital in the production of good j. In addition, w is the wage rate, and τj represents the net taxes on production. Each of these variables take different values for each sector. Finally, p_m represents the aggregate price index of imported products. The final price q_j is the result of using an indirect tax on the total output of the sector such that:

$$q_j = p_j\, (1 + \text{output}j)$$

3. Simulations and results

On the basis of the controversy set out above in the introductory section regarding the existence or nonexistence of tourism taxes in Andalusia and based on the variety and complexity of the tourism taxes applied in each autonomous community, in order to carry out our simulations, we calculated the total output of the tourism sector for each of these communities, as well as the revenue obtained by these communities in 2019 (i.e., the last prepandemic year; making calculations using data from 2020 makes no sense as these data would be distorted by the effects of COVID-19 and thus not represent the real tourist situation). Once these data were obtained, we calculated the tax burden ratio.
These calculations can be seen in the following tables.

Table 1. Tourist taxes applied in the Balearic Islands.

Total output	Collection in year 2019	Ratio
2,031	131	0.0645

Source: author's own elaboration based on data from the input–output tables published by the Balearic Islands Institute of Statistics.

Table 2. Tourist taxes applied in Catalonia.

Total output	Collection in year 2019	Ratio
2,043	54	0.0267

Source: author's own elaboration based on data from the input–output tables published by the Generalitat de Catalunya.

As seen from these tables, the total outputs are practically identical, and the ratios differ in terms of tax collection, since the numbers of hotel beds in each community are also very similar (318,954 beds in the Balearic Islands compared to 397,746 beds in Catalonia).

Using these calculated tax burden ratios and extrapolating to Andalusia, we obtained the following table.

Table 3. Simulation of the application of tourism taxes in Andalusia.

Total output	Collection in year 2019	Burden on Balearic output	Burden on Catalan output
4,130	-	0.0317	0.0132

Source: author's own elaboration based on data from the input–output tables published by the Andalusian Institute of Statistics and Cartography (IECA).

The total output of the Andalusian tourism sector is double that of the Balearic Islands and the Catalan community, which is logical taking into account the size of Andalusia and the number of accommodations available in Andalusia (i.e., 546,517). The simulated tax collection would be approximately 5% if the ratio supported by the Balearic Islands was applied and approximately 7% if the Catalan ratio were applied (see appendix).

In CPI terms, this would mean an increase of 0.18% in the Balearic model and 0.25% in the Catalan model. Therefore, in both simulations, the fiscal pressure on output would imply an increase in the CPI, as we can see in Table 4. This result is in line with the increase in sector prices. In other words, an increase in hotel prices implies an increase in the CPI. This in turn translates into slight inflation, which would mean an increase in prices.

Table 4. CPI impact in both models.

	Balearic Model	Catalan Model
CPI	1.0018	1.0025
	0.18%	0.25%

Source: author's own elaboration.

The following table indicates the sectors that would be the most affected by the introduction of a tourist tax.

Table 5. Extract of the sectors most affected by the tourist tax.

N°	Sector	Balearic Price	Catalonia Price
71	Nonmarket education	1.0015	1.0021
73	Nonmarket health activities	1.0015	1.0021
74	Market social service activities	1.0014	1.0021
75	Nonmarket social service activities	1.0015	1.0021
81	Activities of households acting as employers of domestic staff or as producers of goods and services for their own use	1.0018	1.0025

Source: author's own elaboration.

It is important to highlight at the sectoral level that sectors 71, 73, 74, 75 and 81 are the ones that would be most strongly affected by such a tax. In this way, we can see how the repercussions of the tourist tax are not innocuous beyond the tourism sector.

4. Conclusions

In this work, we have used a price model to analyze the impact of the application of a tourist tax in Andalusia. Based on the SAM that was constructed for this region using data from 2016, we have been able to introduce the structural coefficients and fiscal parameters necessary to carry out the operational analysis of our model. We have analyzed the incidence of introducing a tax rate on prices. There are some previous works, such as the evaluation of the indirect tax on the sale of fuel (Cansino et al., 2007), which have served as a reference. The usefulness of this type of multisectoral model as an analysis tool that endogenizes economic interdependence and allows the effects of variations in fiscal parameters to be quantified has, we believe, been made clear.

First, in quantitative terms, we can state that subjecting Andalusia to the same tax burden on total output as that implemented in the Balearic Islands would mean an increase of 5% in tourism sector prices (see appendix); in terms of CPI, such a tax burden would mean

an increase of 0.18%. If we make the same comparison using the same tax burden on total output as that implemented in Catalonia, we can state that such a tax would mean an increase of 7% in tourism prices (see appendix). In CPI terms, such a tax would mean an increase of 0.25%. Therefore, in both simulations, the tax burden on total output would lead to an increase in CPI.

Second, in relation to the methodology used, we should point out that the main usefulness of multisectoral models as a tool for analysis is the endogenization of economic interdependence, which allows us to quantify the effects of the simulated variations in fiscal parameters. However, we must also note that while the price model is sufficient for the purpose of the current study, if we wished to obtain a more general, comprehensive and detailed model, we should use an applied general equilibrium model (Cardenete and Sancho, 2002).

Finally, in relation to the simulations carried out and on the basis of the results obtained, we can observe that the introduction of a tourist tax will not contribute to tourist demand; however, we could consider whether such a tax could be beneficial. For example, some Catalan economists argue that it is not the existence of the tourist tax that is currently affecting the drop in the number of tourists received but rather the effects of the ongoing pandemic. It is true that in the wake of a global pandemic that has paralyzed the world is not the best time to impose a new tax or to continue applying such taxes.

5. Acknowledgements

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APPENDIX I

Table 1. Andalusian SAM for the year 2016 including both simulations.

Nº	Sector	Balearic Price	Catalonia Price
1	Agriculture. livestock and hunting	1.0002	1.0003
2	Silviculture and logging	1.0011	1.0016
3	Fishing and aquaculture	1.0002	1.0003
4	Extractive Industries	1.0000	1.0000
5	Processing and preserving of meat and production of meat products	1.0002	1.0003
6	Processing and preservation of fish. crustaceans and molluscs	1.0001	1.0001
7	Preparation and preservation of fruits and vegetables	1.0004	1.0005
8	Manufacture of fats and oils	1.0002	1.0003
9	Manufacture of dairy products	1.0001	1.0001
10	Manufacture of milling. bakery and pasta products	1.0003	1.0005
11	Other food industries. Tobacco	1.0001	1.0001
12	Manufacture of beverages	1.0002	1.0003
13	Textile industry. garment manufacturing. leather and footwear industry	1.0001	1.0001
14	Wood and cork industry	1.0003	1.0004
15	Paper industry	1.0001	1.0002
16	Graphic arts and reproduction of recorded media	1.0008	1.0012
17	Coke and refined petroleum products. Chemical manufacturing	1.0001	1.0001
18	Manufacture of paints. cleaning supplies. perfumes. cosmetics and other chemical products	1.0001	1.0001
19	Manufacture of pharmaceutical products	1.0000	1.0000
20	Manufacture of rubber and plastic products	1.0002	1.0002
21	Manufacture of cement. lime. gypsum and their derivatives	1.0003	1.0004
22	Manufacture of ceramic products. tiles. bricks and other baked earth for construction	1.0001	1.0001
23	Glass and stone industries	1.0005	1.0007
24	Metallurgy. Manufacture of iron. steel and ferro-alloy products	1.0001	1.0002
25	Manufacture of metal products. except machinery and equipment	1.0004	1.0005
26	Manufacture of computer. electronic and optical products	1.0000	1.0001
27	Manufacture of electrical material and equipment	1.0001	1.0001
28	Manufacture of machinery and equipment	1.0001	1.0001
29	Manufacture of motor vehicles. trailers and semi-trailers	1.0000	1.0001
30	Naval building	1.0008	1.0011
31	Manufacture of other transport material. except shipbuilding	1.0003	1.0005

32	Furniture manufacturing	1.0002	1.0003
33	Oher manufacturing industries	1.0001	1.0001
34	Repair and installation of machinery and equipment	1.0006	1.0009
35	Production. transmission and distribution of electrical energy	1.0001	1.0002
36	Gas. steam and air conditioning supply	1.0002	1.0003
37	Collection. purification and distribution of water	1.0011	1.0015
38	Collection and treatment of wastewater; collection. treatment and disposal of waste; valorization; decontamination activities and other waste management services	1.0006	1.0009
39	Building	1.0007	1.0010
40	Sale and repair of motor vehicles and motorcycles	1.0009	1.0013
41	Wholesale trade and trade intermediaries. except of motor vehicles and motorcycles	1.0008	1.0011
42	Retail trade. except of motor vehicles and motorcycles	1.0008	1.0012
43	Land and pipeline transportation	1.0007	1.0009
44	Maritime and inland waterway transport. Air Transport	1.0001	1.0001
45	Storage and activities related to transport	1.0005	1.0008
46	Postal and postal activities	1.0014	1.0020
47	Accommodation services	1.0516	1.0738
48	Food and beverage services	1.0006	1.0008
49	Edition	1.0002	1.0003
50	Cinematographic. video and television program activities. sound recording and music publishing; radio and television programming and broadcasting activities	1.0006	1.0009
51	Telecommunications	1.0002	1.0003
52	Programming. consulting and other computer-related activities; Information services	1.0006	1.0008
53	Financial services. except insurance and pension funds	1.0009	1.0013
54	Insurance. reinsurance and pension funds. except compulsory Social Security	1.0003	1.0005
55	Auxiliary activities to financial services and insurance	1.0004	1.0005
56	Real Estate activities	1.0000	1.0000
57	Legal and accounting activities; activities of the headquarters; business management consulting activities	1.0005	1.0007
58	Architectural and engineering technical services; technical testing and analysis	1.0007	1.0010
59	Investigation and development	1.0011	1.0016
60	Advertising and market research	1.0002	1.0003
61	Other professional. scientific and technical activities	1.0004	1.0006
62	Veterinary activities	1.0019	1.0027
63	Rental activities	1.0002	1.0002
64	Employment-related activities	1.0018	1.0026

65	Activities of travel agencies. tour operators. reservation services and related activities	1.0003	1.0004
66	Security and investigation activities	1.0009	1.0012
67	Services to buildings and gardening activities	1.0013	1.0019
68	Administrative office activities and other auxiliary activities to companies	1.0011	1.0015
69	Public administration and defense; compulsory social security. Extraterritorial organizations	1.0013	1.0019
70	Market education	1.0012	1.0018
71	Non-market education	1.0015	1.0021
72	Market health activities	1.0008	1.0012
73	Non-market health activities	1.0015	1.0021
74	Market social service activities	1.0014	1.0021
75	Non-market social service activities	1.0015	1.0021
76	Creative. artistic and entertainment activities; Libraries. archives. museums and other cultural activities; gambling and betting activities	1.0006	1.0008
77	Sports. recreational and entertainment activities	1.0012	1.0017
78	Associative activities	1.0011	1.0016
79	Repair of computers. personal effects and household items	1.0004	1.0006
80	Other personal servicies	1.0003	1.0005
81	Activities of households as employers of domestic staff or as producers of goods and services for their own use	1.0018	1.0025

Source: author's own elaboration.