

The economic and social value of spa tourism: the case of Maresme, Spain

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Abstract

The aim of this article is to assess both the economic and social value of spa tourism, being the first paper in carrying out this analysis. The study has been conducted in Maresme, a region of Catalonia, Spain. On the one hand, an Input-Output (IO) model with a Social Accounting Matrix (SAM) has been carried out to assess the economic value. On the other hand, a Cost-Benefit Analysis (CBA) has been used to monetise the social value in this region, taking into account, among other concepts, direct and indirect health profits, given that balneotherapy helps to alleviate various diseases. The results show that whereas the economic multiplier is 1.529 considering the direct and indirect effects and 1.712 taking into account also the induced effects, being similar to health and medical tourism multipliers, social value generates additional positive value, given that the cost-benefit ratio is 2.082. The theoretical implications of the paper as well as the findings' implications for policy so as to encourage investments in spa tourism are discussed.

Keywords: economic value; social value; spa tourism; input-output analysis; social accounting matrix; cost-benefit analysis; balneotherapy; multiplier; Maresme; Catalonia; Spain.

Introduction

Spas offer an alternative to conventional tourism, not only because of their intrinsic characteristics as health resorts, but also because of the possibilities they offer in the environments where they are located. Therefore, it is vital for these resorts to be able to combine perfectly these two activities of

46 health and tourism, enriching them with new offers of leisure activities [1,2]. Nonetheless,
47 balneotherapy—the therapy consisting of the use of mineral medicinal water as an external application
48 or by inhalation—is indeed the greatest strength and the most differentiated feature of spa tourism. In
49 this regard, some studies have analysed how balneotherapy has improved different diseases, such as
50 arthrosis [3], arthritis rheumatoid [4], and fibromyalgia [5]. Therefore, spa tourism does not only
51 generate economic value but also social value among their users and, at the end of the day, for society.
52 Whereas firms have been commonly regarded just as mere generators of economic value, relegating to
53 a secondary role the social value they might generate, some researchers have integrated both values
54 into a more cohesive approach [6-14].

55 As far as tourism is concerned, most papers analyse only the economic impact of industries and events,
56 mainly by means of input-output (IO) analyses [15,16], without taking into account the social value
57 created. For instance, [17] carries out an IO analysis in order to calculate the economic multiplier of
58 hotel industry in Texas, USA. [18-22] analyse the economic impact of sporting tourism events
59 concluding with its positive effects on the economy. [23] estimates by means of an IO analysis the
60 economic impact of seven sport tourism events in South Carolina, USA. [24] performs an economic
61 analysis of the impact of medical tourism industry in Kwangwon province, South Korea. [25] carries
62 out an IO analysis of the Portuguese Health Tourism Programme for the elderly. [26] estimates the
63 economic impact of Yeosu Expo 2012, Korea, using a regional IO model. [27] analyses the economic
64 contribution—proposing a multi-period IO approach—of tourism demand for Jämtland, Sweden. [28]
65 analyses the economic impact and viability of the 2018 Winter Olympics in Pyeongchang, South
66 Korea, by means of the latest available IO tables.

67 Although some papers use cost benefit analysis (CBA) [29] to assess only the economic impact of
68 tourism [26,30,31], some tourism articles have dealt with social value creation by means of carrying
69 out a CBA [32]. [33] performs a CBA of Kenya's national parks in order to monetise socioeconomic
70 and environmental impacts, whereas [34] carries out a CBA of park tourism in regard to Bavarian

Forest National Park, Germany. [35] analyses both the economic—by means of an IO analysis—and social yield—by means of a CBA—of investing on hiking tourism in Berguedà county, Spain. [36,37] analyse the social impact of sporting tourism events.

Spas have a high potential to attract visitors to destinations. Nevertheless, they have not received much attention in literature, especially with regard to quantifying both the benefits and costs of investing in spas and in such a way to offer multipliers that can be used to assess and make investment decisions.

Whereas there are many articles that analyse the cost-effectiveness of spa therapies in regard to different diseases [38-43] this is the first paper that analyses the economic value of spa tourism by means of an input output analysis including a Social Accounting Matrix (SAM). Furthermore, this is the first article that takes into account social value by means of carrying out a cost benefit analysis of spa tourism. All in all, the main contribution to the field of this paper is the assessment of both the economic and social yield of investing on spa tourism.

After the introduction, section 2 sets the context of the analysis by means of discussing spa tourism and Maresme region. Section 3 analyses the methodologies used, namely IO analysis and CBA. Section 4 shows and discusses the results obtained. Finally, section 5 finishes with the main conclusions of the paper and suggests future lines of research.

Context of the analysis: Spa tourism and the analysed region

The first spas were initially designed to recover health. Over 2000 years ago, in many cultures such as Arabic, Greek and Roman water was used with therapeutic purposes and for this reason facilities were built on the outskirts of natural fountains, from which medicinal waters flow, in order to be able to use them to treat several diseases [44].

The tradition of thermal baths has been handed down from one generation to the next. Despite the fact that throughout the first half of the 20th Century spas declined considerably at the social level, because

they were viewed as places where people would go only in need of therapeutic stays and on medical prescription. In the 1980's hydrotherapy underwent a revival and spas reached their maximum splendour, thanks to the influence of several organizations, administrations and health specialists, who raised awareness of the fact that spas are a favourable environment, not only to cure diseases, but also to prevent them and to gain a better quality of life from an integral perspective [45].

Spas have evolved from health-care establishments in the 19th Century, to leisure and tourism facilities in the 20th Century. So, after having been in decline for some years, spas have nowadays become centres of high-quality tourist attraction, since they are becoming leisure areas, offering a wide range of tourism and leisure activities, other than baths in mineral-medicinal waters and massages (without losing their *raison d'être*, namely the use of mineral-medicinal waters). Catalonia [Nomenclature des Unités Territoriales Statistiques II (NUTS-II)] has not remained oblivious to this fact and is among the most important European thermal centres because of the properties of the mineral-medicinal waters that can be found in its several spas.

This paper will focus on two thermal villages located in the Maresme county (NUTS-IV): Caldes d'Estrac (NUTS-V) and Arenys de Mar (NUTS-V), municipalities for which health tourism is an important source of resources. Table 1 shows their main features.

Table 1. Comparison between spas

Location	Caldes d'Estrac	Arenys de Mar
Name	Balneari Públic de Caldes	Balneari Titus
Opening year	1818	1794
Number of visitors per year	2,100	1,220
Rooms	No	No
Management	Public	Private
Other attractions of the area	Gastronomy ("La pesolada"), climate and proximity to the sea	Nautical activities, cultural heritage, important festivals and traditions and gastronomy (Squids from Arenys)

Caldes d'Estrac is a very important thermal village, its thermal baths have been throughout history the main attraction of the village and the properties and benefits of its water have always been highly

115 appreciated. Since the days of ancient Rome (when the place was named *Aquae Calidae*) and later,
116 with the Arabs, people of all times and cultures have enjoyed the water from *Caldes d'Estrac* because
117 of its characteristics, particularly suitable for health care. It is worth mentioning that these waters are
118 very hard to be found, because of their unique chemical characteristics. The water from *Caldes d'Estrac*
119 is mesothermal chlorinated-sodic, springing from 2,800 meters deep at 38,8° Celsius degrees; the only
120 water which chemical composition must not be altered, neither to cool it down or warm it up. The
121 public spa dates from the beginning of the 19th Century (specifically, from 1818). But *Caldes d'Estrac*
122 is important not only because of their waters relevance, but this village has several tourist attractions
123 that make it an area visited by people from abroad at any time of the year. On the one hand, it is because
124 of its gastronomy, since *Caldes d'Estrac* is also known as “*el poble de la pesolada*” (the peas event
125 town), because every year in spring they held a gastronomic event known as “*la pesolada*” that focuses
126 on a variety of peas (“*pèsols*” in Catalan), which is known all around Catalonia and is one of the best
127 tourist attractions in *Caldes d'Estrac* because of its originality. On the other hand, it attracts visitors
128 because it is a seaside town or because of its enviable climate

129 The seaside town *Arenys de Mar* is another important town that has purely mineral-medicinal waters.
130 Their thermal waters were also discovered during the Roman era. The empire citizens were acquainted
131 with the water springs, took advantage of them and appreciated highly the healing properties of the
132 natural warm water. In the year 1794, the thermal waters named *Banys de Can Titus* were open to the
133 public; its waters spring up at 38° (Celsius) and are collected only 200 meters from the seashore. After
134 a short period of inactivity, *Can Titus* reopened its doors in 1992, renovated as a modern spa. *Arenys*
135 *de Mar* does not stand out only because of its water, but also because it is a gastronomic village par
136 excellence and participates in several gastronomic days of the region, using locally grown products
137 among which stand out the Squids from *Arenys de Mar*. Additionally, since *Arenys de Mar* has over
138 400 years of history, it has a great cultural heritage as well as several important festivals and traditions.

Finally, it is also well known for its “Sea tourism”, because as a coastal town it hosts several nautical activities.

Methodology

The direct and the indirect economic benefits will be computed by means an IO analysis. To this end, a survey was administered in two important spas in Maresme in order to estimate the economic impact. Finally, by means of a Cost Benefit Analysis, the social costs and benefits have been included.

Economic impact of spa tourism on the Maresme county: IO analysis and SAM

In this subsection we analyse the methodology in regard to the economic impact generated by investment in spa tourism. The money spent in Maresme by the visitors attracted to this area by its offer in spa tourism generate an economic impact. The majority of studies just focus on direct economic impact, namely the money spent by spa tourists in the county (on restaurants, food, hotels, shopping, and so forth). The methodology most commonly used to measure indirect effects is the IO analysis. In IO models inter-industry input-output relations as well as final demand (such as investment, consumption, imports, exports) are taken into account simultaneously [46]. Therefore, we can estimate the impact caused by an external demand shock upon the economy as a whole (the expenses of tourists—day-visitors and visitors who stay overnight at the destination). Tourism industry encompasses several sectors and, consequently, any supply-side shock and/or demand given to this sector brings about not only industrial but also inter-industry impacts. Tourists’ spending, which are normally determined by means of surveys, has been used as the main input to estimate, by means of an IO analysis, the economic impact. Usually, the result obtained is the multiplier effect on the host economy derived from

the spending in one category. By multiplier effect we refer to the increase in the final income generated by the chain reaction triggered in the local economy when there is new extra spending in this category. It includes the direct and indirect multipliers. Direct effects are the increase in companies' sales revenues or tourist spending. Afterwards, firms need other firms located in the county to provide them with inputs, these other firms in turn need other different firms to provided them with inputs, and so on. These are the indirect effects that normally affect many sectors of the economy, in contrast with those that are most specifically related to tourism, such as the effects generated by tourist spending. Social Accounting Matrices (SAM) are widely applied to calculate the induced effects [46-48]. As stated earlier, with regard to spatial dimension of these effects, they are limited to the area to the Maresme county.

The traditional IO economic impact model is frequently used to conduct studies on tourism and recreation [49], despite the fact that its limitations are widely known [50-52]. Critics of traditional IO models claim that since relative prices are fixed, inputs cannot be substituted, there is an unlimited amount of available factor inputs and a linear relation between direct and indirect effects. Among other things, the aforementioned limitations entail that the economic activity of a region and the positive multiplier effects will always expand as the result of a growth in demand (in tourism) in that region. Consequently, economic impacts may be overestimated. To deal with this limitation, General Equilibrium models (GEM), which have modified IO models, for instance non-linear IO models [49], are more suitable in the economic impact evaluation [50,51]. Nonetheless, a large amount of information is required in GEM and on some occasions, as in this study, this information is not available for researchers. Furthermore, GEM and non-traditional IO analysts state that if the analysis is carried out on a region that is not particularly large in comparison to the economy of reference [51], or the income from the spending of tourists is not large enough to change prices relatively [49], traditional IO models are suitable and can provide realistic results. Our study fulfils these two conditions: on the one hand, the economic region of Maresme is relatively small in comparison with

Spain as a whole (Maresme's GDP represents only approximately .8% of the Spanish GDP), and on the other hand, at the present moment spa tourists spending in Maresme does not change significantly the final demand. Consequently, a traditional IO model has been chosen to run the analysis of the economic impact (the total amount of direct and indirect effects) generated by investing in spa tourism in Maresme.

Given that this is the first paper that carries out an input output analysis in regard to spa tourism, we have searched for previous studies on medical and health tourism and the total multiplier ranges between 1.654 and 1.742 [24,25,53]. Therefore, the spas tourism multiplier from Maresme is not expected to be exactly among this range but it is expected to be somehow similar to these values.

Questionnaire data

A survey was administered to calculate the direct economic impact. The fieldwork was conducted during the months of March, April and May, 2016 in two spas located in the Maresme county: the spa Balneari Titus in Arenys de Mar and Balneari Públic de Caldes d'Estrac. The questionnaire consisted of 22 questions divided into 5 differentiated sections: Socio-economic data, profile of visitor/tourist, profile of the visit, spending level and a final section named "willingness to pay", which purpose is to make an assessment of spa tourism. We started with a population of 3,320 spa visitors per year; of which 1,220 corresponded to the spa Titus and 2,100 to the Balneari Públic de Caldes d'Estrac. In total, 305 surveys were conducted. Keeping into account the total population, it is estimated with 95% confidence that, with this sample's size, the maximum error rate is 4.82%. During the survey process, surveys have been administered to different individuals randomly selected from among the two spas' visitors. Furthermore, the days have been scheduled by the managers of the centres, choosing those with highest attendance of visitors.

Cost-Benefit Analysis

CBA analyses, in addition to economic and non-economic costs, the economic benefits as well as other additional benefits derived from investments in spa tourism. Therefore, this methodology goes one step beyond because it assesses several social variables and some effects that Input-Output Outcomes and other methodologies do not take into account.

CBA includes costs and benefits that are inherently social, namely social costs and benefits, among which tangible and intangible ones are included, in addition to monetary and non-monetary costs and benefits. Hence, CBA is used to measure costs and benefits in monetary terms, in order to obtain the “net benefit” (namely, the net present social value), which is a single measure of social yield. Net benefits are positive when this figure is positive, meaning that social benefits are higher than costs, this proves that the investment is profitable from a social point of view. By means of this proceeding it is possible to compare alternative uses of funds and resources, and consequently decision-makers are able to compare the net social value of alternative investment when taking investment decisions. In the public sector CBA is frequently used to make investment decisions; so much so that many public projects need to pass a CBA prior to their implementation in order to quantify and demonstrate their net social value.

With the aim of obtaining a single figure of net social value, CBA has to assess, in monetary terms, all costs and benefits (present time equivalent). Among these costs and benefits are included those with no market prices (intangibles; [54]). It was easier to calculate benefits obtained from the economic impacts and the spending of visitors and in the previous section: for example, there is a market price to stay in paid accommodations, for food and beverages or sports apparel. The market price expresses, under certain circumstances (for instance, in perfect competitive market), the individual’s valuation on goods or services to measure the extent to which they are willing to pay for them. In regard to intangibles, market price or observable monetary figure for the valuations of individuals do not exist.

Hence, different methodologies need to be used to value intangibles. The basic methods are revealed preferences techniques (or indirect methods) and stated preference techniques, such as contingent valuation methods (or direct methods). Revealed preferences techniques are based upon the market decisions of an individual (individuals who pay or accept a compensation by purchasing or selling, for instance). These decisions can be used to “reveal” the valuation individuals place on intangibles. Some of the most frequently used techniques, which have been used in this study, are hedonic prices, the travel cost method, productivity models and human capital models. A specific method is required for each case of analysis (for instance, the travel cost method is useful to value natural parks with no entry price, despite the fact that it is not suitable when parks are very near to individuals’ homes). By contrast, to find valuations in non-real cases stated preference techniques prove to be useful; to this end, individual are asked if they would pay or accept a compensation in the event of hypothetical market-simulated situations.

Results

Direct economic impact

The profiles of spa tourists obtained from the survey were the following ones (Table 2): The average age is around 57 years. But an in-depth analysis of the age range shows that the predominant age group is of over 61 years old. Furthermore, it can be observed that in all the age ranges, there is a significant majority of women.

Table 2. Summary of the results obtained from the survey. Visitors' profile, their habits and other relevant information

Age	>61
Women	66%
University graduates	48%
Retired	50%
Origin: Catalonia	83%
Frequency of sporadic visit	75%
Relax as main motivation	50%
Visitors accompanied by partners	50%
Visit typology: spend night in the county (tourists)	60%
Type of accommodation: 4-star hotel	77%
Type of accommodation: Full-board	72%

As mentioned, when it comes to genders distribution, a great disparity has been observed. With regard to the origin, as can be seen in table 2, 83% of the respondents are from Catalonia. So, Catalans are the main users and customers of spa tourism in the Maresme county. The remaining 17% is divided into 15% from the rest of Spain and 2% of international tourists. Having said that, if we split the previous percentages, Barcelona province (NUTS-III) is the origin of the majority of users from Catalonia. At the international level, basically there are four places of provenance: Andorra, France, United Kingdom and Russia.

One more question in the section about socio-economic data was the highest level of completed education. The sample shows that the majority of spa users are people with advanced education. Specifically, 48% of the respondents have university degrees and 27% have post-compulsory education studies. Another question deals with their employment status: students, unemployed, retired or active people. Most of the spas' visitors are retired people, 50% of cases, which explains why the predominant age range is of those over 61 years old, as mentioned earlier. That is so because most of the spas potential customers are IMSERSO groups [IMSERSO, *Instituto de Mayores y Servicios Sociales* (Institute for Older Persons and Social Services), is a Spanish public institution that promotes tourism

273 and hydrotherapy programmes among the elderly, which are cheaper than the market price, given that
274 they are partly paid by this institute]. Additionally, the rest of individuals are unevenly distributed.
275 41% of them are active people, whereas 6% and a tiny percentage (3%), are students. That can be
276 explained by the fact that the students' purchasing power does not allow them to afford this kind of
277 services. Furthermore, we presume that the younger a person is, the less appealing spa tourism is for
278 them, either because they prefer other kinds of tourism rather than the one under analysis or because
279 they do not need it.

280 By means of these data, the user profile of spa tourism can be synthesized as women over 61 years old
281 and consequently, retired but with university degrees. Therefore, having a medium-high purchasing
282 power.

283 Another important aspect to be analysed are the results of the questions related to the visitors'
284 behaviour during their stay in the spa, in particular their motivation and frequency. Users were asked
285 how often they visit the spa. 75% of respondents go to spas sporadically (in most cases once or twice
286 a year). In contrast, the rest of users are divided, almost equally, into the first time (10.49%), monthly
287 (8.20%) and weekly (5.90%).

288 Regarding the question about their main motivation to visit the spa, in 50.16% of cases, it was search
289 of relaxation. In the second place we find recovery, with 28.20%, followed by healing a sickness
290 (13.77%), prevent sicknesses (5.90%) and leisure (1.97%). In the survey is analysed also who
291 accompanies visitors, differentiating the groups by individually, couples, families and groups. We can
292 see that nearly 50% of users are accompanied by their partners, whereas 15.41% are families and 2.30%
293 in groups. It is noteworthy that 3 out of each 10 users go to the spa alone.

294 The behaviour of spa users with regard to their accommodation consumption habits is analysed. It is
295 essential to differentiate between day visitors (and who consequently do not spend the night) and the
296 visitors staying overnight in the Maresme county (named tourists). According to the data obtained, in
297 60% of cases they are tourists that spend the night in the county whereas el 40% are day visitors. It is

also interesting to find out the proportion of this 60% of visitors that is included in the IMSERSO social hydrotherapy program. Tourists, namely visitors who stay overnight in Maresme county, are analysed, whereas day visitors are left aside.

Furthermore, the typology of the chosen accommodation and the type of stay are analysed. These data are very important because they can affect directly the consumption level of the visitors in the county of Maresme. With regard to the accommodation typology, the most commonly chosen by visitors are 4-star hotels. This analysis of the accommodation typology should be accompanied by an analysis of the type of stay at the establishment. In the questionnaire there are 5 possible types of stay: self-catering, bed and breakfast, half board and full board. Nonetheless, it has been convenient to add another possible type of stay, named private accommodation in order to be able to include those staying in apartments, second homes, friends and relatives houses and others, who have their own kitchen and, therefore, will spend less in eating and drinking than those who will eat at dining establishments. The predominant stay typology is full-board. This type of stay is linked to the type of accommodation most commonly chosen by visitors: 4-star hotels.

These data suggest that this situation is due to the fact that out of 60% the visitors who need accommodation, 72.7% are tourists on a package tour of the IMSERSO social hydrotherapy program. Since none of the two chosen spas offer accommodation, they have an agreement with the 4-star Volga, located in Calella, to offer accommodation to the 72.7% of visitors from the social hydrotherapy program. Consequently, because of this situation, the preferred accommodation is 4-star hotel and, therefore, the predominant type of stay is full-board.

The analysis of the visitors' expenditure in the Maresme county during their visit has been divided into three distinct groups: accommodation expenditure and treatments, (this is so because visitors in the IMSERSO group cannot provide a breakdown of their expenses in accommodation and treatments, therefore, the average spending in both concepts together was estimated), spending in restaurants and provisions and, finally, other expenses, which include shopping, culture and sports.

323 **Expenditure in accommodation and treatments.** In this case the procedure has been as follows: the
324 total average of the visitors' expenditure in accommodation and treatments in each of the spas was
325 calculated (being €359.53 for spa in Caldes d'Estrac and €136.27 for spa in Arenys de Mar) and it was
326 multiplied by the number of visitors per year of both spas (1,220 and 2,100 respectively). As a result,
327 the total expenditure in accommodation and treatments amounts to **€724,427.60**.

328 **Expenditure in restaurants and provisions.** Following the same procedure as in the previous
329 paragraph, the total average expenditure in restaurants and provisions was calculated: €74.69 for spa
330 in Caldes d'Estrac and €49.19 for spa in Arenys de Mar. In this case, the total expenditure of users in
331 restaurants and provisions amounts to **€194,420.80**.

332 **Other expenditures.** Finally, the visitors' expenditure in shopping, culture and sports has been
333 estimated using the same method, namely calculating the users' total average expenditure in these three
334 concepts in both Arenys de Mar (€88.98) and Caldes d'Estrac (€24.75) and it has been multiplied by
335 the number of users per year: the total expenditure in shopping, culture and sports amounts to
336 **€160,530.60**.

337 Therefore, taking into account the previous results, it can be said that the users' total direct expenditure
338 in Maresme amounts to **€1,079,379.00**.

339 It has also been analysed what is the surplus value of spas customers. Firstly, the questionnaire asks
340 whether they would keep coming even though the expenses increases in certain quantities. If the answer
341 is yes, they are asked how many more euros would they be willing to pay, offering the following
342 options: from €30 up to €210. We can see that 63.61% of users claim that, even if the cost is increased,
343 they would go to spas, whereas the remaining 36% would not pay more money. Furthermore, bearing
344 in mind that 63.61% of users would increase their expenses, it is analysed the amount; that is to say,
345 how many more euros would they be willing to pay. 66.49% of users would be disposed to pay up to
346 30 more euros. 21.65% would pay up to 60 more euros and 7.73% would pay €90. Only 3.09% of
347 respondents would be willing to pay up to €120 and .52% would pay up to €150. Likewise, .52% of

them would pay €210. After having obtained these data, we want to know how much more would each person be disposed to pay by means of calculating the sum of multiplying the extra amount by the percentage.

Table 3. Willingness to Pay Calculation (in euros)

Extra amount (in euros)	Percentage	Result (in euros)
€30	66.49%	19.95
€60	21.65%	12.99
€90	7.73%	6.96
€120	3.09%	3.71
€150	.52%	.77
€180	.00%	.00
€210	.52%	1.09
Total		45.47

If the result of multiplying the extra amount they would be willing to pay by their percentage, is multiplied by the 194 people who claim to be willing to pay more money, and we divide it into our sample (305), we obtain that each person would pay an average of through to €28.92 at most.

IO analysis

To conduct an analysis of the economic impact of any investment, it is necessary to use the so called input-output tables. This method allows quantifying the impact of a change in the demand or in the activity of a productive sector upon the economy as a whole. More precisely, the input-output table allows calculating the economic effects both in a direct and caused way and, at the same time, distinguishing the consequences produced in each productive sector [55].

But the most interesting aspect is that input-output tables provide us not only an overall picture, but also disaggregated of a specific economy, and provide knowledge about sectorial interrelations. Therefore, one of their features is that they reflect the technical relations existing among the different productive sectors, materialized in what a sector needs from the inputs produced by the other sectors

for its activity to be developed. The relations we are referring to are represented by a matrix in which are compiled the goods and services flow values of the economy within a specific territory.

The table presents two readings. On a horizontal axis, the rows record the different uses of each sector's production, that can be intermediaries or final users. On the other hand, on the vertical axis, columns reflect, for each sector, the resources that have been used to obtain the effective production.

All things considered, input-output are useful for two reasons: first of all, because they provide a representation of the economy as a whole divided into activity branches by quantifying the transactions among them, the production of each branch destined for final demand and their use of primary resources. Secondly, it allows us analysing the effects produced when there are changes in the demand of any branch over the rest of them.

The method that will be used in our case will be explained in the following lines. Using the information included in the input-output table, we can obtain a set of elements that make up the calculation model used to carry out the analysis of impact and the multiplier effects of an investment or the expenditure in a specific territory. The model to quantify the economic impact is based on the technical coefficients matrix and on the Leontief inverse matrix.

The vertical technical coefficients are the translation into unitary values of the data included in the columns of the input-output table. So, they define the consumption needs as intermediaries of each productive branch in order to obtain one product unit. The formula is the following:

$$a_{ij} = x_{ij}/x_j \quad (1)$$

Where: x_{ij} is the branch's amount of products i used by branch j to obtain its production x_j . To put it another way, it is the need that branch j has of the products provided by branch i to obtain one unity of the good it produces. Consequently, the set of technical coefficients for each productive branch defines what is known as the intermediate consumptions matrix (a).

As we have seen, the coefficient technical matrix allows analysing the effects derived from the modifications on the economic activity. Nevertheless, these effects are produced beyond the productive

branch which activity has been increased, since increasing in one unit the final demand of products of branch j will imply the supply of all the intermediate inputs needed to carry out the production but, it will also trigger a chain of subsequent needs.

This means that increasing the activity of one productive branch will generate an increase in the demand of inputs to be able to carry out this activity:

$$X_1 = A \cdot D \quad (2)$$

A is the technical coefficients matrix, D the vector of the increase in demand and X_1 the needs of provision of the new inputs. But this increase in the need for inputs brings about a new need for inputs to produce them:

$$X_2 = A \cdot X_1 = A \cdot (A \cdot D) = A \cdot D(3)$$

And so on and so forth, because each new production requires new inputs to be supplied. This interactive model allows to grasp the sequential chain of needs for inputs to be able to meet the needs for imputes of the productive system. The result of this chain takes the following form:

$$X = D + A_1 \cdot D + A_2 \cdot D + A_3 \cdot D + A_4 \cdot D + \dots = [I + A + A_2 + A_3 + A_4 + \dots] \cdot D \quad (4)$$

$$X = [I - A]^{-1} \cdot D \quad (5)$$

Where I is the identity matrix, $[I - A]^{-1}$ is named Leontief inverse matrix or demand multiplier, which reflects the needs for supply of inputs that result from a modification in the activity of one or several productive branches. Therefore, the sum of the elements of each of the Leontief inverse matrix columns expresses, as stated earlier, the production increases generated in the economy as a whole due to the activity generated by a productive sector, including the initial activity from which the whole effect is derived.

We need to go back to the data obtained through the fieldwork in order to calculate our expenditure vector. To start with, the visitors' total average expenditure in accommodation, treatments, restaurants,

provisions, shopping, culture and sports has been estimated, which as we have seen, amounts to a total of direct expense of **€1,079,655.98**.

The previous figure allows us to estimate the indirect impact, by assigning it to its corresponding sector in the input-output table (to 10 sectors) of Catalan economy. The result of the direct expenditure (€1,079,655.98€) has been assigned to sector 4 (Commercial Services, transportation and hotel industry). Additionally, the expenses of the two spas (see table 4) have been assigned to their corresponding sector. Thus, staff and marketing has been assigned to sector 8 (professional, scientific, administration and auxiliary services), the electricity, materials, gas and maintenance to sector 2 (industrial products and sanitation), municipal business, water tax and taxes are assigned to sector 9 (public administration services, education and health care), hotel's expenses, van and diesel oil as well as miscellaneous have been assigned to sector 4 (commercial services, transportation and hotel industry) and, finally, the expenses in the new building to sector 3 (building works).

Table 4. Annual costs of spas (in euros)

	Balneari Públic de Caldes (Caldes d'Estrac)	Balneari Titus (Arenys de Mar)	Both
Staff	96,000	112,700	208,700
Electricity	12,000	9,500	21,500
Equipment	0	22,000	22,000
Gas	3,000	9,000	12,000
Municipal Tax	15,000	0	15,000
Catalonian Taxes	2,000	0	2,000
Marketing	3,000	15,830	18,830
Hotel	90,000	116,550	206,550
Maintenance	12,000	20,000	32,000
Van and Petrol	11,200	10,500	21,700
New Construction	45,000	35,000	80,000
Miscellaneous	10,000	0	10,000
TOTAL	299,200	351,080	650,280

Pre-multiplying the Leontief inverse matrix by our D vector, allows us to obtain the figure of the total economic impact produced by spa tourism. As shown in table 5, we have obtained a result of €2,645,313.17, of which €1,729,935.98 correspond to direct impact and €915,377.19 to the indirect economic impact. Therefore, spa visitors generate a total multiplier of 1.529.

Table 5. Direct, indirect and total impact by sectors (in euros).

			Direct	Indirect	Total
1	A	Agricultural and fishery products	.00	12,112.39	12,112.39
2	B,C,D,E	Industrial products and sanitation	87,500.00	218,777.29	306,277.29
3	F	Building Jobs	80,000.00	79,035.92	159,035.92
4	G,H,I	Commercial, transport and hospitality services	1,317,905.98	257,105.17	1,575,011.15
5	J	Information and communication services	.00	15,997.90	15,997.90
6	K	Financial and insurance services	.00	48,669.25	48,669.25
7	L	Real estate services	.00	100,342.13	100,342.13
8	M,N	Professional, scientific and auxiliary services	227,530.00	173,255.62	400,785.62
9	O,P,Q	Public administration, education and health services	17,000.00	4,887.02	21,887.02
10	R,S,T,U	Artistic, entertainment and other services	.00	5,194.50	5,194.50
Total			1,729,935.98	915,377.19	2,645,313.17

The Social Accounting Matrix (SAM) and induced effects

The standard IO model proves to be useful to calculate the indirect economic impact brought about by visitors' spending, since it includes interdependence amongst the production industries of an economy and gives information concerning intermediate and final demand. Nevertheless, something else is needed in order to estimate induced effects. We refer to induced effects when anyone whose income increases (such as employees) spends the new income generated by the visitors' spending in the region. An additional effect is generated on final demand. Macroeconomic accounts are needed to calculate induced effect. To obtain the relationship between wellness tourism industry and macro-economy, the Catalan IO table is inserted into a SAM. A SAM is an economy's snapshot for a specific year and it consists of a double-entry table that describes and synthesizes economy's structure in terms of the connections between production, demand and the distribution of income. Additionally, it includes the

expenditure and revenue of all the institutions and agents of an economy [47]. As a square matrix that records flows of all transactions (by equalizing total expenditures/leakages to total incomes/injections), it provides a balanced macroeconomic position. An IO table is included in the SAM and, for this reason, one of its most important weaknesses is that it is demand-driven and it has an excessive capacity of assumption [48]. Nonetheless, as argued above, this limitation is not very relevant in this study. We have used the SAM created by [56] for the year 2005 to estimate the induced economic effects. The relations between consumption and income in the Catalan economy are covered. As Table 6 shows, when the calculations include induced effects, there is an increase in the previous economic impact figures, that included only direct and indirect effects. As can be seen in Table 6, total impact, in terms of output, is €2,961,626.59; whereas in terms of added value it amounts to €1,617,945.90 and in terms of employment 33.16. All these figures, which have been delimited territorially in order to analyse only the economy of Maresme county, have been calculated too in relative terms. The Value Added impact is .02% of Maresme's Gross Added Value, the output impact represents .03% of the GDP and the employment impact is .10% of total unemployment. Whereas spa visitors generate a total multiplier of 1.529 taking into account direct and indirect impacts, the multiplier is 1.712 considering also induced effects.

Table 6. Total impact of spas.

Concept	Total= Direct+ indirect+ induced
Output	€2,961,626.59
Value Added	€1,617,945.90
Employment	33.16

Net social value: Cost Benefit Analysis of investing in spa tourism in Maresme

The cost-profit analysis method, as mentioned above, allows us quantifying in monetary terms both the profit and social costs involved in a specific actuation upon the whole society. Next, a socio-

economic evaluation based on the ACB, defining and valuing the costs and profits generated by spa tourism in Maresme society is presented.

Costs

The year costs of the corresponding spas, provided by their managers are summarized in table 4. Total costs of the two spas are estimated to amount to €650,280.

Direct Economic Benefits

We have already estimated that the direct economic benefit of spa tourism amounts to **€1,079,379.00**.

Direct Health Benefits

In this section we will focus on assessing the benefits of the spa's mineral-medicinal waters on health, and consequently, the savings it generates in social costs. Therefore, the benefits perceived by the society when users take advantage of these spas where they can be in contact with their mineral-medicinal waters. [57] states that there is scientific evidence that the spas' mineral-medicinal waters, from now on balneotherapy, relieve the pain in some illnesses. [57] uses the US Agency for Health Care Policy and Research system to rate the strength of scientific evidence [58], where the following six levels are used and the recommendation grade is given: Ia. Meta-analysis of high-quality clinical studies (A); Ib. At least one high-quality clinical study (A); IIa. Well designed nonrandomized prospective study (B); IIb. Well designed quasi-experimental study (B); III. Well designed observational studies (B); IV. Documents or opinions from think tanks and/or clinical experiences from prestigious authorities (C). In regard to the recommendation grades which is provided in parentheses, A means high, B means medium and C means low.

In this article we are going to focus just on grade A diseases, which are those with several corroborated good-quality clinical studies, or at least one good-quality clinical study of scientific evidence, respectively. So, the diseases we refer to are Arthrosis, Rheumatoid Arthritis and Fibromyalgia.

In this point, we have searched and used clinical studies to identify the percentage of improvement in patients after balneotherapy. With balneotherapy, there is an improvement of 49% in arthrosis [3]. With regard to arthritis rheumatoid, the improvement is of 22% [4], and when it comes to Fibromyalgia, balneotherapy improves in 54% [5]. Additionally, we have found out the yearly direct cost of this diseases for the Spanish National Health. In regard to Arthrosis, it costs €1,502 per patient per year [59]. The cost per patient per year in the case of Arthritis Rheumtoid amounts to de €5,000 [60] and Fibromyalgia represents an annual cost of €10,000 per patient [61]. Whereas 4.37% of the Spanish population suffers from Arthrosis [59], .5% suffers from Arthritis Rheumtoid [60] and 2.4% from Fibromyalgia [61]. Using the obtained data and taking into account the sum of the number of annual visitors in *Balneari Titus* of Arenys de Mar as well as the *Balneari Públic* of Caldes d'Estrac, namely 3,320, we can find out the reduction of social costs related to these three diseases by means of (6).

$$DHB = \sum_{d=1}^n I_d \cdot C_d \cdot P_d \cdot V \quad (6)$$

Where *DHB* is the Direct Health Benefits, *d* is the different diseases improved by balneotherapy, *I_d* is the percentage of improvement due to balneotherapy, *C_d* is the direct annual cost for the Spanish National Health, *P_d* is the percentage of the Spanish population suffering from these diseases and *V* is the total number of annual visitors that use these two spas.

By means of this procedure we reach the conclusion that the saving for National Health in the expenditures corresponding to the diseases Arthrosis, Rheumatoid Arthritis and Fibromyalgia amounts to €555,310.92

Nevertheless, this amount has been estimated for the global scope, since not only national citizens have been surveyed, but also people from abroad. Therefore, this amount needs to be delimited to the

territory of Maresme county. Taking into account that, according to our surveys 30% of visitors are from Maresme, we conclude that the saving in cost for the National Health in Maresme amounts to €166,593.28. Nonetheless, we must recognise that these are very conservative hypotheses, given that we are assuming that the users of spas suffer from these diseases in the same proportion than the Spanish population.

Indirect Health Benefits

In this section we aim to estimate the indirect benefits of balneotherapy on health. To run this calculation, it must be taken into account that balneotherapy reduces employee absenteeism by 30% [62]. Furthermore, if we take into consideration that the annual average employee absenteeism in Catalonia is 9.9 days, balneotherapy would reduce absenteeism in 2.97 days (30% of 9.9 days). Given that the average annual wage is €23,849 [63], that 41% of the 3,320 annual customers of the two analysed spas are active, we conclude that the benefit in euros of balneotherapy on productivity is €264,153.09 ($€23,849 \times 2.97 / 365 \times 41\% \times 3,320$). Nonetheless, given that only 30% of the users of these spas live in Maresme county, we consider that the indirect health benefits amount to €79,245.93€ ($30\% \times €264,153.09$).

Consumers' Benefit

Finally, as stated earlier, we have some prices that prove the aforementioned social assessment of spa tourism and that have allowed us translating them into money.

This means that, since the benefit of spa tourism has a market and consequently, a directly observable price, we can know the consumer's willingness to pay by means of the price they are already paying. This can be related to the consumer surplus theory, understanding this concept as the monetary profit obtained by consumers.

In this case, we can see that 63.61% of visitors are paying for visiting spas at a price which is lower than what they are disposed to pay. So, in this point we aim to calculate the amount of money with which spa users value this activity, over its purchase price.

So, as we have seen, according to the 63.61% users that would be disposed to pay more, it has been estimated that the additional amount of money each person would pay (or the consumer surplus) is: €28.92.

By multiplying this value by the 30% of people coming from Maresme and by the total number of annual visitors (3,320), we obtain the value of the spa tourism for the residents is **€28,808.75**.

Total benefits

According to table 9, adding up the direct economic benefits, the direct and indirect profits for health and the valuation of spa tourism, we find that the total annual benefit of spa tourism in the Maresme county amounts to **€1,354,026.96**.

Result of the analysis

Given that the benefits of spa tourism are higher than its costs, according to table 7, we can conclude that the net social benefits of spa tourism have in the Maresme county amount to **€703,746.96**. In particular, by estimating the ratio benefit-cost, we obtain that each euro invested by the Public Administration in spa tourism generates **€2.082** for the Maresme society.

Table 7. Summary of benefits and costs (in euros)

Benefits	In euros	Costs	In euros
B1. Direct economic impact	1,079,379.00	C1. Expenses and investment	650,280.00
B2. Direct health benefits	166,593.28		
B3. Indirect health benefit	79,245.93		
B4. Consumers' benefit	28,808.75		
B. Total	1,354,026.96	C. Total	650,280.00
Cost–benefit ratio (B/C)	2.082		
Net social benefit (B-C)	703,746.96		

560

561 Discussion and conclusions

562 This article is the first one to analyse both the economic and social yield of investing on spas tourism.

563 This analysis has been conducted in Maresme county where two spas are located, being one of them

564 public and the other one private. Instead of taking a perspective only based on the traditional IO model,

565 where only economic impact is assessed, social value has also been taken into account by means of a

566 CBA. The latter are less frequently used, given that they require more information and that there is a

567 lack of standardised methodology to assess social value. Nonetheless, CBAs are a more accurate

568 methodology, given that social value, such as direct and indirect health benefits, are taken into account.

569 On the one hand, IO model results suggest that, taking into account only economic value, investing on

570 spa tourism is a profitable investment. Spas' activity generates a total multiplier of 1.529 taking into

571 account the direct and indirect effects and 1.712 considering also the induced effects by means of the

572 use of SAM, which are similar to those analysed in previous papers in regard to health and medical

573 tourism [24,25,53] which ranges between 1.654 and 1.742, although slightly lower.

574 On the other hand, taking into account the social value generated by spa tourism, direct and indirect

575 health profits have also been considered because balneotherapy improves several diseases [3-5].

576 Additionally, consumer's benefit has also been included. CBA results suggest that investing in spas

577 tourism generates both high net social benefits and cost-benefit ratio, specifically, every euro invested

in spa tourism produces 2.082 of return to society. These results have been obtained considering very conservative hypotheses so as to not favour this kind of investments, which could be considered a mischievous practice [64,65]. The main contribution of CBA to spa tourism, for both practice and policy, has to do with the fact that it provides decision makers with the information they need to decide about these investments, in view that it considers benefits that are not usually taken into account by organisations and governments that focus almost exclusively on direct economic effects. Furthermore, CBA is also relevant for researchers because it provides a more comprehensive perspective in comparison with analyses that focuses only on economic benefits.

There are five policy implications in this article. First, given that there is a lack of standardized methodology, it provides a methodology to quantify the economic and social impact of spa tourism by means of combining direct, indirect and social effects that should be accounted for in order to assess the actual value of these initiatives by local governments. Second, a positive and significant effect generated by the presence of spas in a region in terms of economic and social value is demonstrated by the results of this analysis. Third, spa tourism can be considered another product to be sold by destinations, which should be complemented with other touristic products, namely gastronomic and sporting, so has to create a healthy tourism package. Fourth, given that the paper performs an evaluation of spa tourism when calculating their economic and social impact, quantitative criteria are given to authorities in order to facilitate the decision making process when choosing which product should be promoted when comparing spa tourism to others options. Finally, Maresme can be considered a successful case and an example to be imitated by other counties that want to change their tourism models.

The limitations of this paper have to do with the local perspective that has been taken, given that only Maresme county has been analysed, and that a limited number of economic and social effects have been considered. That is the reason why future lines of research should focus on performing similar analyses for a wider territory, for instance, Catalonia which is a region with a considerable number of

spas and high-quality thermal water. Futures studies could also include and assess environmental costs, in regard to CBA analysis. Additionally, future papers should address the issue of how spa tourism could impact on destination image, being aimed at monetising these effects. For the time being, it has been necessary to ponder over the validity of each and every variable used to monetise social value. Therefore, future papers should create a standardised methodology to assess the social value generated by spas and wellness tourism, which could include both the necessary data as well as the key performance indicators to manage these institutions efficiently under a multistakeholders' perspective.

Acknowledgements

We acknowledge support of the publication fee by Universidad Internacional de la Rioja (UNIR) and Fundació Tecnocampus Mataró-Maresme.

References

1. Dryglas D. Wellness as a new direction of development of Polish spa resorts. *International Journal of Spa and Wellness*. 2020;3:2-3: 69-81. doi: 10.1080/24721735.2020.1857207
2. Szymanska E, Lech, J. *Modern Tendencies in Spa Tourism: Innovations*. Varazdin: Varazdin Development and Entrepreneurship Agency (VADEA); 2017.
3. Olabe-Sánchez PJ, Chazarra-Zapata JJ, Martínez-Broseta AF, Martínez-Soriano MC, Bonito-Gadella, JC, Fernández-Aparicio, T. Balneoterapia en la patología de rodilla en las personas mayores. *Revista de Fisioterapia*. 2004;5.
4. Verhagen AP, Bierma-Zeinstra SMA, Cardoso JR, De Bie RA, Boers M, De Vet HCW. Balneoterapia para la artritis reumatoide, 2, *Cochrane Library*; 2005.
5. Porro J, Estévez A, Rodríguez A, Suárez R, González B. Guía para la rehabilitación de la fibromialgia. *Revista Cubana de reumatología*. 2015;17(2): 147-156.
6. Nelson RR, Winter SG. *An Evolutionary Theory of Economic Change*. Cambridge, Massachusetts: Harvard Univeristiy Press; 1982.
7. Williamson OE, Winter SG. *The Nature of the Firm: Origins, Evolution, and Development*. New York: Oxford

University Press; 1993.

8. Torres-Pruñonosa J, Retolaza JL, San-José L. Gobernanza multifiduciaria de stakeholders: análisis comparado de la eficiencia de bancos y cajas de ahorros. *Revesco Revista de Estudios Coopeativos*. 2012;108: 152-172. doi: 10.5209/rev_REVE.2012.v18.39591
9. Torres-Pruñonosa J, Plaza-Navas MA, Díez-Martín F, Prado-Roman C. The Sources of Knowledge of the Economic and Social Value in Sport Industry Research: A Co-citation Analysis. *Front. Psychol*. 2020;11: 629951. doi: 10.3389/fpsyg.2020.629951
10. Torres-Pruñonosa J, Raya JM, Dopeso-Fernández R. The Economic and Social Value of Science and Technology Parks. The Case of Tecnocampus. *Frontiers in Psychology*. 2020;11: 632600. doi: 10.3389/fpsyg.2020.632600
11. San-José L, Retolaza JL, Torres-Pruñonosa J. Empirical Evidence of Spanish Banking Efficiency: The Stakeholder Theory Perspective. In: Gil-Lafuente AM, Gil-Lafuente J, Merigó-Lindahl JM, editors. *Soft Computing in Management and Business Economics Studies in Fuzziness and Soft Computing*. Berlin, Heidelberg: Springer; 2012. pp. 153-165. doi: 10.1007/978-3-642-30451-4_11.
12. San-José L, Retolaza JL, Torres-Pruñonosa J. Efficiency in Spanish banking: A multistakeholder approach analysis. *Journal of International Financial Markets, Institutions and Money*. 2014;32: 240-255. doi: 10.1016/J.INTFIN.2014.06.005.
13. Retolaza, JL, San-José L, Torres-Pruñonosa J. Socio-Economic Return of Start-Up Companies: An Advantage of Entrepreneurship. In: Peris-Ortiz M, Sahut JM, editors. *New Challenges in Entrepreneurship and Finance: Examining the Prospects for Sustainable Business Development, Performance, Innovation, and Economic Growth*. Cham: Springer; 2015. pp. 259-271. doi: 10.1007/978-3-319-08888-4_19.
14. Retolaza JL, San-José L, Torres-Pruñonosa J. Legitimizing and Delegitimizing Factors of Firms in Society: Is It a Problem of Communication or Strategic? An Approach Based on the Distributed Social Value as the Key Factor for the Organizations' Social Legitimacy. In: Díez-De-Castro E, Peris-Ortiz M, editors. *Organizational Legitimacy: Challenges and Opportunities for Businesses and Institutions*. Cham: Springer International Publishing; 2018. pp. 159-170. doi: 10.1007/978-3-319-75990-6_10. 2018.
15. Fletcher JE. Input-output analysis and tourism impact studies. *Annals of Tourism Research*. 1989;16(4): 514-529. doi: 10.1016/0160-7383(89)90006-6.
16. Silovská HC, Kolařík P. Traditional and alternative methods of tourist event evaluation: case study of the Czech Republic, *Economic Research-Ekonomska Istraživanja*. 2019;32(1): 2063-2079. doi:

- 10.1080/1331677X.2019.1642777.
17. Kim H, Kim B. Economic impacts of the hotel industry: An input-output analysis. *Tourism Review of AIEST–International Association of Scientific Experts in Tourism*. 2015;70(2): 132-149. doi: 2145/10.1108/TR-11-2014-0056
 18. Selva M, Luisa M, Puertas Medina RM. Impacto económico de la celebración de un evento deportivo: Campeonato del Mundo de MotoGP en Valencia. *Estudios de Economía Aplicada*. 2012;32: 683-702. Asociación de Economía Aplicada (ASEPELT).
 19. Gratton C, Shibli S, Coleman R. The economic impact of major sports events: a review of ten events in the UK. *The Sociological Review*. 2006;54(2): 41-58.
 20. Benages E, Cucarella V, de Guevara JF. Impacto económico de la XXXII edición de la Copa América en Valencia. Instituto Valenciano de Investigaciones económicas; 2007.
 21. Aza R, Baños-Pino J, Canal JF, Rodríguez P. The economic impact of football on the regional economy. *International Journal Sport Management and Marketing*. 2007;2: 459-474.
 22. Drakakis P, Papadaskalopoulos A, Lagos D. Multipliers and impacts of active sport tourism in the Greek region of Messinia. *Tourism Economics*. 2020; 135481662090232. doi: 10.1177/1354816620902328
 23. Daniels MJ, Norman WC. (2003) Estimating the Economic Impacts of Seven Regular Sport Tourism Events. *Journal of Sport & Tourism*. 2003;8(4): 214-222. doi: 10.1080/1477508032000161528
 24. Zhu Y. The Economic Effects of Medical Tourism Industry on Kwangwon Province. *Journal of Tourism Management Research*. 2011;15(3)
 25. Eusébio C, Carneiro MJ, Kastenholtz E, Alvelos H. The Economic Impact of Health Tourism Programmes. *Quantitative Methods in Tourism Economics*. 2012;153-173. doi: 10.1007/978-3-7908-2879-5_9
 26. Lee CK, Mjelde JW, Kwon YJ. Estimating the economic impact of a mega-event on host and neighbouring regions. *Leisure Studies*. 2015;36(1): 138-152. doi: 10.1080/02614367.2015.1040828
 27. Kronenberg K, Fuchs M, Lexhagen M. A multi-period perspective on tourism's economic contribution—a regional input-output analysis for Sweden. *Tourism Review*. 2018;73 (1): 94-110. doi: 10.1108/TR-03-2017-0044
 28. Wood J, Meng S. The economic impacts of the 2018 Winter Olympics. *Tourism Economics*. 2020;135481662092157. doi: 10.1177/1354816620921577
 29. Vanhove N. Tourism project and Cost-Benefit Analysis. In: *Handbook of Tourism Economics: Analysis, New Applications and Case Studies*. Tisdell, CA; 2013. pp. 393-415.
 30. Barajas A, Lago-Peñas S, Sanchez, P. On the Regional Economic Effects of the Pope's Journeys: Evidence from

the Visit to Santiago de Compostela in 2010. *Tourism Economics*. 2014;20(2): 279-299.
doi:10.5367/te.2013.0270

31. Salgado-Barandela J, Barajas Á, Sánchez-Fernández P. Sport-event portfolios: An analysis of their ability to attract revenue from tourism. *Tourism Economics*. 2019;135481661988444. doi: 10.1177/1354816619884448
32. Kirkby CA, Giudice-Granados R, Day B, Turner K, Velarde-Andrade LM, Dueñas-Dueñas A, et al. (2010) The Market Triumph of Ecotourism: An Economic Investigation of the Private and Social Benefits of Competing Land Uses in the Peruvian Amazon. *PLoS ONE* 5(9): e13015. <https://doi.org/10.1371/journal.pone.0013015>
33. Cheung H. Tourism in Kenya's national parks: A cost-benefit analysis. *Studies by Undergraduate Researchers at Guelph*. 2012;6 (1). doi: 10.21083/surg.v6i1.2019
34. Mayer M. Can nature-based tourism benefits compensate for the costs of national parks? A study of the Bavarian Forest National Park, Germany. *Journal of Sustainable Tourism*. 2014;22(4): 561-583. doi:10.1080/09669582.2013.871020
35. Raya, JM, Martínez-García E, Celma, D. Economic and social yield of investing in hiking tourism: the case of Berguedà, Spain. *Journal of Travel & Tourism Marketing*. 2018;35:2: 148-161. doi: 10.1080/10548408.2017.1350252
36. Jiménez-Naranjo HV, Coca-Pérez JL, Gutiérrez-Fernández M, Sánchez-Escobedo MC. Cost-benefit analysis of sport events: The case of World Paddle Tour. *European Research on Management and Business Economics*. 2016;22(3): 131-138.
37. Hurtado JM, Ordaz JA, Rueda JM. Evaluación del impacto económico y social de la celebración de grandes eventos deportivos a nivel local: El caso del Campeonato de Tenis femenino de la ITF en Sevilla en 2006. *Revista de métodos cuantitativos para la economía y la empresa*. 2007;3: 20-39.
38. Allard P, Deligne J, Van Bockstael V, Duquesnoy B. Is spa therapy cost-effective in rheumatic disorders? *Reveu du Rhumatisme*. 1998;65(3): 173-180.
39. Fioravanti A, Valenti M, Altobelli E, Di Orio F, Nappi G, Crisanti A, Cantarini L, Marcolongo R. Clinical efficacy and cost-effectiveness evidence of spa therapy in osteoarthritis-The results of "Naiade" Italian Project. *Panminerva Medica*. 2003;45(3): 211-217.
40. Brefel-Courbon C, Desboeuf K, Thalamas C, Galitzky M, Senard JM, Rascol O, Montastruc JL. Clinical and economic analysis of spa therapy in Parkinson's disease. *Movement Disorders*. 2003;18 (5): 578-584. doi: 10.1002/mds.10404
41. van Tubergen A, Boonen A, Landewe R, Rutten-Van Molken M, Van der Heijde D, Hidding A, Van der Linden S. Cost effectiveness of combined spa-exercise therapy in ankylosing spondylitis: A randomized controlled trial. *Arthritis & Rheumatism-Arthritis Care & Research*. 2002;47(5): 459-467. doi: 10.1002/art.10658

- 716 42. Zijlstra TR, Braakman-Jansen LMA, Taal E, Rasker J; van de Laar MAFJ. Cost-effectiveness of Spa treatment for
717 fibromyalgia: general health improvement is not for free, *Rheumatology*. 2007;46(9): 1454-1459. doi:
718 10.1093/rheumatology/kem157
- 719 43. Mourgues C, Gerbaud L, Leger S, Auclair C, Peyrol F, Blanquet M, Kwiatkowski F, Leger-Enreille A, Bignon YJ.
720 Positive and cost-effectiveness effect of spa therapy on the resumption of occupational and non-occupational activities
721 in women in breast cancer remission: A French multicentre randomised controlled trial. *European Journal of Oncology*
722 *Nursing*. 2014;18(5): 505-511. doi: 10.1016/j.ejon.2014.04.008
- 723 44. Melgosa FJ. Turismo de salud: Termalismo y Balnearios. Tirant lo Blanc; 2000.
- 724 45. [Anonymous]. La nueva edad de oro de los balnearios españoles. *Savia*. 2006;48-52.
- 725 46. Pyatt G, Round, JI. Accounting and fixed price multipliers in a social accounting matrix framework. *The Economic*
726 *Journal*. 1979;89: 850-873. doi :10.2307/2231503
- 727 47. Thorbecke, E. Social accounting matrices and social accounting analysis. In: Isard W, Azis JJ, Drennan MP, Miller
728 RE, Saltzman S, Thorbecke E, editors. *Methods of international and regional analysis*. Brookfield, VT: Ashgate
729 Publishing Company; 1998.
- 730 48. Akkemik KA. Assessing the importance of international tourism for the Turkish economy: A social accounting matrix
731 analysis. *Tourism Management*. 2012;33(4): 790-801. doi: 10.1016/j.tourman.2011.09.002
- 732 49. Klijs J, Peerlings J, Heijman W. (2015). Usefulness of nonlinear input–output models for economic impact analyses in
733 tourism and recreation. *Tourism Economics*. 2015;21(5): 931-956. doi: 10.5367/te.2014.0398
- 734 50. Blake A, Durbarry K, Sinclair MT, Sugiyarto G. Modelling tourism and travel using tourism satellite accounts and
735 tourism policy for forecasting models. *Tourism and Travel Research Institute Discussion Paper*. 2001;4.
- 736 51. Dwyer L, Forsyth P, Spurr R. Evaluating tourism’s economic effects: New and old approaches. *Tourism Management*.
737 2004;25(3): 307-317. doi: 10.1016/S0261-5177(03)00131-6
- 738 52. Sun YY. Adjusting input-output models for capacity utilization in service industries. *Tourism Management*.
739 2007;28(6): 1507-1517. doi: 10.1016/j.tourman.2007.02.015
- 740 53. Carneiro MJ, Eusébio C, Kastenholz E, Alvelos H. Socioeconomic Impacts of Health Tourism: An Analysis of a
741 Portuguese Programme. 2013. In: Joukes V, Gomes LL, Costa AM, editors *Sustainable Medical and Wellness*
742 *Destination: Client, Result and Innovation–Focused Case Studies*. Vila Real: Universidade de Trás-os-Montes e Alto
743 Douro; 2013. pp. 46-59.
- 744 54. Florio M. *Applied welfare economics: Cost-benefit analysis of projects and policies*. New York: Routledge; 2014..

55. Andreu L, Raya JM. Estudi del senderisme com activitat turística pel desenvolupament econòmic: El cas del Berguedà; 2015. pp. 71-74.
56. Llop M. The role of saving and investment in a SAM price model. *The Annals of Regional Science*. 2012;48: 339-357. doi: 10.1007/s00168-010-0403-7
57. Llor JL. Evidencia científica de la hidroterapia, balneoterapia, termoterapia, crioterapia y talasoterapia. *Medicina Naturista*. 2008;3(2): 76-88.
58. West S, King V, Carey TS et al. Systems to rate the strength of scientific evidence. *Evidence Report/technology Assessment 47*. AHRQ Publication 02-E016. Rockville, MD: Agency of Healthcare Research and Quality; 2002.
59. Batlle E. Estudio ArtRoCad, Evaluación de la utilización de los recursos sanitarios y la repercusión socioeconómica de la artrosis de rodilla y cadera, Presentación de los resultados preliminares. *Revista Española de reumatología*. 2005;32(1): 22.
60. Gómez N. Repercusión socioeconómica de la artritis reumatoide. *Anales de medicina interna*. 2003;20(3): 111-113.
61. [Anonymous]. Fibromyalgia generates an expenditure of 10,000 euros per patient each year. *Revista de la Sociedad Española del Dolor*. 2009;16(7): 417-418.
62. Ledesma R, Cima A, Julia A, González P. Morbilidad en la discapacidad laboral temporal y su impacto económico. *Contribución a la Educación y la Protección Ambiental*; 2005.
63. INE. Decil de salarios del empleo principal. 2015;20.
64. Crompton JL. Economic impact studies: Instruments for political shenanigans? *Journal of Travel Research*. 2006;45: 67-82. doi: 10.1177/0047287506288870
65. Jeong JY, Crompton JL, Dudensing RM. The potential influence of researchers' "Hidden" procedure decisions on estimates of visitor spending and economic impact. *Journal of Travel Research*. 2016;55(7): 874-888. doi: 10.1177/0047287515605932