Taxing Tourism in Spain: Results and Recommendations

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Summary

This paper analyses the foundations, possible applications and the effects of tourism taxation in Spain. The article begins with an analysis of the economic and environmental reasons for taxing tourism, which would seem to call for taxes based on the principle of benefit, for either revenue or corrective purposes. Subsequently, we describe the praxis of tourism taxation in Spain, with special mention being given to the now repealed Balearic e*cotasa*. Finally, the effects of two fiscal modifications with revenue or corrective objectives are studied through the use of an applied general equilibrium model developed for the Spanish economy. We thus see that a 10% tax on lodging brings in significant public receipts, increases social welfare and has no effect on the environment. On the other hand, an increase of VAT rates on tourism-related sectors could have the same effects on tourist expenditure but at the costs of greater impact for Spain's economy.

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1. Introduction

In recent decades tourism has become a primary economic activity of many countries, with Spain as a good example in the developed world. If the economic benefits of tourism are clear (more added value and employment, for example), the various costs derived from it are also evident (congestion, environmental degradation, etc.). This makes public regulation of tourist activity a necessity, and such regulation must pursue a certain balance, not always easy to reach, in order to attain the maximum net social benefit over time.

Among the public policies affecting the tourism sector, taxation plays an especially important role. This is due, first of all, to the magnitude of the potential revenue in terms of the fiscal system and its high degree of social acceptability. Secondly, its importance is linked to its capacity to act as the substitute of a price for the public goods and services consumed by tourists. Finally, there is the corrective (e.g. environmental) role that these taxes can be given.

For those or other reasons, in recent years many countries have introduced a wide range of taxes on tourism. In particular, some relevant attempts have already been made in Spain and new proposals are to be expected in the next few years. Therefore, given the importance of the Spanish tourism industry and of the efficiency and distributional effects generally associated to taxation, a comprehensive analysis should be carried out on the possibilities and consequences of such policy option. This paper proposes to carry out this analysis through an Applied General Equilibrium Model (AGEM), quite a useful method to deal with these issues but scarcely employed in the literature so far.

The structure of the article is as follows. First of all, the foundations underlying the taxation of tourism are analyzed (section 2) to continue with the description of some practical applications in Spain (section 3). Section 4 shows the main characteristics of the AGEM for the Spanish economy used in this exercise. The following section presents and discusses the simulation results of two hypothetical tax measures

affecting tourism: the introduction of a tax on lodging and the increase of Value Added Tax (VAT) rates levied on tourism-related sectors. Finally, section 6 deals with the main conclusions and recommendations.

2. Foundations of tourism taxation

The tourism sector has grown in importance in recent decades, and is expected to keep on growing around 4-5% per year in the next 50 years (WTO, 1998). Today it represents around 10% of the Gross Domestic Product (GDP) and investment worldwide, obviously being much higher in small tourist economies. This data explains why an activity that has traditionally benefited from low fiscal pressure has now become an important field of action for the fiscal systems of many countries. In fact, tax receipts generated by tourism commonly represent more than 10% of the tax revenue collected by some developed countries, and this figure can approach 100% in certain small tourist economies (McAleer, Shareef and Da Veiga, 2005).

As it will be seen in the following section, tourist activity has been used as a taxable item in accordance with a wide range of formulas and circumstances (see WTO, 1998, for details). However, none of these formulas can be described strictly as tourism taxes, since nearly all goods and services used by tourists (hotels, restaurants, flights, car renting, etc.) are also used by non-tourists. Thus the taxable item is not the tourism but rather a tax base roughly linked to it, so that any fiscal measure addressed to tourism activities has also effects on non-tourists. Consequently, when we refer to tourism taxation in this paper we really mean taxes affecting tourist activities.

Having in mind this limitation, the following paragraphs deal with the foundations of tourism taxation, which can be summarized in three aspects: i) revenue objectives (which are implicitly tax reform objectives), ii) coverage of conventional costs of public services and iii) internalization of external costs. With regard to the first question, a

tourism sector with a high specific weight in the economy is a natural candidate for, at least, average fiscal pressure (derived from tax policies not focused on tourism), but also for higher pressure than average (derived from deliberate tax policies on tourism). The reason for the latter is twofold: the low distortionary effects of this kind of taxation and the exportability of the fiscal burden.

It is well known that a tourism tax distorts when demand is relatively elastic, since the price differential caused by the tax leads to a significant change in behavior. Traditionally it has been considered that many tourist destinations have no clear substitutes (for particular geographical or climatic reasons, distance, quality, etc.), which creates monopoly power in the supply side (see e.g. Gooroochurn and Sinclair, 2005) and also means that price alterations may bring about minor changes in the demand side (low elasticities). This situation could lead to use tourism taxes not only for an easy and efficient collection of revenues from an inelastic base, but also as a way to correct the undesirable effects of market power. Nevertheless, the available data indicates that countries in this situation do not tax tourism more intensely.

Anyway, in recent years price elasticities have increased in some tourist regions mainly due to the incorporation of new countries to tourism markets. This could be the case of the Mediterranean region, where countries like Spain, Italy, Greece, Croatia, Turkey, Egypt, Tunis or Morocco compete nowadays in the same market acting like substitutes. But even when changes in prices bring about distortions in behavior, if the tax incidence falls mainly on the tourist (not on the party offering the tourism service) and the tourist is not a resident (that is, there is tax exportability), the excess burden disappears in the minds of policy makers (Gooroochurn and Sinclair, 2003). According to the empirical evidence the preceding hypotheses are plausible and thus the taxing of tourism becomes more attractive in terms of fiscal reform (see e.g. Fuji, Khaled and Mak, 1985). Nevertheless, this only applies when tourists are not residents in the jurisdiction that levies the tax. This means that exportability of central taxes only works if tourists are foreign, whereas for regional or local taxes would be enough if tourists come from outside the jurisdiction that levies the tax.

A second reason for using these instruments is the specific funding of tourism-related overcosts brought about by a higher provision of public goods and services. Here the tax would act as a price theoretically guided by the principle of benefit and, if the aforementioned overcosts are not covered, it would cause an extra fiscal burden to non-tourist taxpayers. For example, an intensive tourist activity may lead to the need for larger supply of services or infrastructures, such as citizen security or sanitation services, whose costs may not be covered by taxes paid by tourists. But in less intensive tourists regions it is possible that no additional infrastructures or services are needed (e.g. normal levels of citizen security and sanitation services will be sufficient), so the opposite may apply: revenue of taxes paid by tourists may be higher than the costs of the few public services used by them.

Finally, the external costs resulting from tourist activity may be important (Green, Hunter and Moore, 1990). Basically, this area includes environmental costs and congestion, which are not only a by-product of the tourism sector but also an input of its production function. Therefore, public intervention is especially urgent and can be achieved through taxation (see Clarke and Ng, 1993), as economic efficiency will be restored when a corrective tax leads to the inclusion of environmental and congestion (external) costs in the final price of the tourism package. In addition, the effect of the tax on the quality of tourism supply can be significant and this directly affects the tourists' willingness to pay and so the magnitude of the added value by the sector. Furthermore, the tax can be used with a variable time profile to avoid congestion peaks and de-seasonalize tourism activities. However, recalling the impossibility of taxing tourism directly, corrective tax measures will usually affect other agents and economic sectors[1].

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[1] In fact, efficiency and equity considerations suggest that a discriminatory treatment of tourists should be avoided: when using corrective taxes, all agents that cause external costs must be liable to them.

3. Tourism taxation in Spain

As already stated, the tourism sector faces conventional or general taxation on economic activity and also a set of specific taxes. In the case of conventional taxation this sector may be subject to higher rates (e.g. in general sales and income taxes), even though the administrative costs associated to this option make it less attractive from a practical point of view. Specific taxation generally takes the form of taxes on lodging, which are very common in the fiscal practices of both developed and developing countries.

In the case of Spain general (central) taxation on the Spanish tourism sector is usually below average, perhaps due to the difficulty of distinguishing between tourists and non-tourists (see Blake, 2000). At the same time, there is a growing interest in the application of specific (regional) taxes on tourist activities. In a setting where Spanish legislation allows rather meager regional tax baskets, this phenomenon is probably related to the high exportability and revenue collection capacity of such taxes for some Spanish regions (Gago et al., 2006).

For example, this is clearly the case of two regional taxes introduced by the Balearic government: the now repealed *ecotasa* (literally: eco-tax; however, as explained later, the spirit of the true eco-tax is very different from the one of the Balearic project) and the recently announced tax on rented cars[2]. The *ecotasa* charged stays at hotel establishments, the taxpayer being the visitor who paid for the nights at the hotel, with a fixed amount per night for the length of the hotel stay (although it varied according to the type and category of the establishment). Tax receipts were earmarked to a fund that was to finance actions aimed at improving tourist activity and preserving the environment (Palmer and Riera, 2003).

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[2] Though still a project, the tax on rented cars would include a fixed daily payment (between 4.5 and 5 euro depending on cubic capacity) and a variable payment depending on the mileage (between 0.02 and 0.03 euro also depending on cubic capacity). It is still difficult to carry out a proper analysis of the tax, albeit it will probably bring about larger effects than the *ecotasa*.

At a first sight, the *ecotasa* seemed to combine some of the above-mentioned objectives: revenue collection and coverage of costs. Moreover, it could allow for a strategic action on the market in that its deterrent effects could be concentrated in the wholesale packages that target middle-lower incomes, the least desirable segment and the one with the lowest added value. However, its environmental nature was clearly questionable, as it could only have favorable environmental effects through a quantitative reduction and/or qualitative modification of tourism (Gago and Labandeira, 2001).

Indeed, the traditional definition of environmental tax requires that it have a clear and direct relationship with a specific environmental problem to punish the harmful behavior that the tax hopes to modify (see section 2). Obviously, the linkage between the use of accommodation and environmental damage is rather imperfect so the ecotasa fails in this aspect. Despite the insistence of some commentators, earmarking the revenue obtained from a tax to environmental ends does not make it an environmental tax either. Besides, in normal conditions environmental receipts should not be earmarked for environmental expenditure because doing so conditions those policy programs to the eventualities of tax resources and thus may cause over or under provision of environmental protection.

4. The methodology to simulate policy reforms

The tourism sector contributes significantly to Spanish GDP, so taxing this activity could have important effects not only on the tourism sector, but also on the rest of the economy. Empirical studies on tourism taxation have been usually carried out under partial equilibrium approaches (e.g. Gooroochurn and Sinclair, 2005), but a general equilibrium approach is more appropriate to capture the global effect of a particular tax policy. A partial equilibrium approach will analyze only the direct effects on the specific sectors studied. However, that approach will be inappropriate when the specific sectors analyzed have a significant contribution to the economy. For instance,

a tax reform that affects the activity of the Spanish tourism sector could have important consequences in the labor market and in other sectors like construction. Few studies have been carried out using this approach (among them, Blake, 2000; Jensen and Wanhill, 2002), so this paper tries to give a new contribution in this field.

AGEMs are used in economic research to simulate the macroeconomic conditions of a country, region or the world. The name of this methodology refers to the fact that the model contains all markets of an economy (goods, services, factors, etc.) with different degrees of aggregation, which have to be in equilibrium. They combine a mathematical description of the economic relationship between sectors (domestic industry, foreign markets) and institutions (government, households, external sector) with data from national accounts. This section describes the methodology used to fulfill the objectives of this paper. A more technical description of the AGEM is presented in the Appendix and Labandeira, Labeaga and Rodríguez (2006).

The model presented here is designed for a small open economy with seventeen productive sectors. It is a static model because the simulation is carried out for a specific year. Yet firms and households can react to any external stimulus, such as increased prices, through the use elasticities of substitution that allow for endogenous behavior in the model.

Following the disaggregation of the Spanish national accounts, there are three institutional sectors in the economy: a representative household, the public sector and the external sector. Production in each sector is a combination of materials and the remaining productive factors (K, L, energy). Total supply of good i in the economy is a composite good of national production and imports, which are considered imperfect substitutes. The final destination of the supply is the export market and the domestic market.

On the one hand, the public sector collects taxes on income, consumption and production, payroll taxes (paid by employers) and a tourist tax that is initially zero. It

also obtains capital income, makes net transfers with other institutions and consumes goods and services. The result is a public budget in deficit and financed with the savings of other institutions. On the other hand, the representative household has a fixed amount of time that can be devoted to the consumption of leisure or to supply labor. It obtains income from both labor and capital, makes transfers with other institutions and pays various taxes[3]. Its objective is to maximize its welfare according to its budgetary restrictions. The welfare function depends positively on the consumption of leisure, goods and services.

The model assumes a small open economy that exchanges goods and services with other economies and makes net transfers. Furthermore non-resident households in Spain (mainly tourism) consume also goods and services. Exports and imports allow for equilibrium in the balance of payments. The macroeconomic equilibrium is determined by the economy's capacity or need for financing with regard to the exterior (exogenous variable), which is equal to the difference between the national savings (defined endogenously by each of the institutions) and investments. The model also assumes that domestic markets of goods and factors are perfectly competitive, with no involuntary unemployment. Capital and labor supplies are perfectly mobile among sectors but are immobile internationally, although the capital supply is inelastic.

The database comes from a National Accounting Matrix for the Spanish economy (NAM-95), constructed upon the basis of national accounts for the year 1995 and published by the Spanish Institute of Statistics (INE, 2002). Table A1 in the Appendix depicts the fields of activity used for the purposes of this study and their correspondence with other statistical classifications. Moreover, the NAM-95 has been enlarged with data from the Satellite Accounts of Tourism in Spain for the year 1996 (SAT-96) and published in INE (2001). In particular, we use the expenditure shares of non residents in the SAT-96 to calculate their equivalence in the NAM-95, which only includes the total amount of purchases by non residents in 1995. The SAT-96 has eight

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[3] The representative household does not provide (sell) goods and services to the economy, with the exception of labor.

characteristic goods associated to tourist activities and two other goods (Table A2 in Appendix). Tourist characteristic goods have been aggregated following the sectors in the NAM-95, whereas the other goods were disaggregated in food and beverages, chemical products and other manufactures by assuming the same shares on expenditure as Spanish households.

Based on the NAM-95 data, the parameters of the model are calibrated: tax rates, technical coefficients of the production functions, consumption and utility. The criterion used is that the AGEM be capable of reproducing the data of the NAM-95 as an optimal solution or equilibrium, which will be used as a benchmark. In the initial equilibrium prices are equal to the unit, with the effects of the reforms being estimated as relative changes in the production and the relative prices. Certain parameters, such as the elasticities of substitution, were not calibrated but were rather taken from other studies[4].

5. Simulating the effects of some tourism taxes in Spain

Given the importance of the Spanish tourism sector and the role that could be played by the taxation of this activity, this section deals with the effects of two taxes with effects on tourism. As mentioned above, it is not possible to strictly talk about tourist taxes, but some tax reforms with an a priori special effect on tourism activities can be defined. Two alternative tax policies are analyzed through the AGEM model for the Spanish economy, with the revenue obtained being fully refunded to the citizens by means of lump-sum transfers.

First, the implementation of an *ad valorem* tax on hotel occupancy is considered. There are three reasons for choosing this tax: (i) lodging taxes are one of the more

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[4] The wage elasticity of labor supply was calibrated to -0.4, similar to that estimated for Spain by Labeaga and Sanz (2001). Price elasticity of the total expenditure made by non-resident consumers in Spain was calibrated to -1.73, in accordance with the estimates obtained for Andalusia in Lozano, Morales and Navarro (2000).

used ways to tax tourists, especially in small tourist economies (McAleer et al., 2005), (ii) among taxes affecting tourism, at least in tourist regions, this is perhaps the one which has a better connection with tourism, and (iii) it is an easy way to allow for different levels of taxation for different lodging categories.

The simulated tax is considerably more potent than the Balearic *ecotasa*, and it is paid by non-resident consumers (basically, incoming tourist consumption). Unfortunately, the database used in this study does not disaggregate the expenditure on restaurants and lodging. As the latter represents approximately 35% of the total outlay (INE, 2001), and the purpose is to simulate a tax rate of 10% on the expenditure for lodging, the tax rate finally used is 3.5% of on the expenditure in both groups of goods.

Secondly, the effects of a rise in VAT rates applied on the consumption on tourism-related sectors (hotels, restaurants, cafes, bars and similar services) are analyzed. The reason for this simulation is that in Spain reduced VAT rates (7%) are applied, which contrasts with the widespread application of higher rates in other European countries and with the initiatives by the European Commission to considerably limit reduced VAT rates within five years. Therefore, two changes in VAT rates are considered: a moderate increase from 7% to 12%, and an ambitious reform raising the VAT of these services to the general rate in Spain (16%).

5.1. Effects of a tourist tax on lodging

The impact of this tax on the economy as a whole is not significant, in terms of either the GDP or employment. There are not also significant variations in prices, capital or labor income. Perhaps most noteworthy is the limited effect of the tax on the activity of the hotel and restaurant sector (*HOST*), which falls only slightly, by -0.8% (see Table 1). As a consequence, there is also a small reduction on employment in this sector, by a -0.9%. Despite this, the tourist tax is able to generate a tax yield for the government of about 359 million Euros.

Table 1. Changes (%) on production and real prices

	Tax on lodging		VAT 12%		VAT 16%	
	Production	P_i	Production	P_i	Production	P_i
AGRICULTURE	0,00	0.00	0.20	- 0.20	0.30	- 0.30
MINERY	0.17	0.00	0.12	- 0.10	0.20	- 0.10
ENERGY	0,09	0.00	0.04	- 0.20	0.13	- 0.22
FOOD	- 0.10	0.00	- 0.20	- 0.10	- 0.50	- 0.20
MANUFACTURES	0.19	0.00	0.31	- 0.10	0.57	- 0.11
CONSTRUCTION	0.00	0.00	- 0.20	- 0.10	- 0.30	- 0.10
SERVICES 1	0.10	0.00	0.20	- 0.10	0.40	- 0.20
HOTEL & REST.	- 0.80	0.00	- 2.90	3.50	- 5.70	7.00
TRANSPORT	0.00	0.00	0.00	0.00	0.10	0.00
SERVICES 2	0.10	0.00	0.20	0.00	0.30	0.00
CPI	--	0.00	--	0.50	--	0.90

Source: the authors.

Table 2. Changes on non-resident consumption (million euros and %)

	Pre-reform	Tax on lodging		VAT 12%		VAT 16%	
	Original €	Final €	Variation %	Final €	Variation %	Final €	Variation %
FOOD	1,209	1,194	- 1.25	1,194	- 1.25	1,179	- 2.49
MANUFACTURES	1,930	1,905	- 1.29	1,904	- 1.32	1,880	- 2.57
SERVICES 1	1,416	1,398	- 1.27	1,398	- 1.27	1,381	- 2.50
HOTEL & REST.	10,754	10,259	- 4.60	10,247	- 4.71	9,781	- 9.05
TRANSPORT	2,915	2,878	- 1.27	2,875	- 1.35	2,837	- 2.67
SERVICES 2	956	944	- 1.27	942	- 1.39	930	- 2.72
TOTAL	*19,178*	*18,577*	*- 3.14*	*18,560*	*- 3.22*	*17,986*	*- 6.22*
CPINR	--	--	*1.90*	--	*2.00*	--	*9.00*

Source: the authors.
Notes: CPINR is the relative change in the CPI for non-resident consumers.

Table 2 shows that the most significant effects are felt by non-resident consumers. In general, the consumption of goods and services falls by -1.3% approximately that in the case of hotel and restaurant services is equal to a -4.6% decrease. As a result, non-resident consumers reduce their total expenditure in Spain by around -3.1% in response to the 1.9% increase in the prices of their consumption basket in Spain. In spite of its limited economic consequences, the effects on social welfare of the tourist tax, in combination with lump-sum transfers, are positive by an amount around 363 million Euro.

5.2. Effects of a moderate rise in VAT rates

A moderate increase in VAT applied to hotels, restaurants and similar services, is also simulated by increasing tax rates by approximately 67% from the actual reduced tax rate (7%) to 12%. The results show that this reform will have a modest effect on the economy with a reduction in the real GDP at market prices around -0.2%. As a consequence, there would be no significant effects on aggregated employment levels that only drop slightly by -0.2%. Changes on capital and labor income would be however more important, -0.5% and -0.8% respectively, but they are still restrained. Table 1 shows the effects on prices (market prices) which are not significant, except again for hotels and restaurants, that increase their prices by 3.5%, and an overall rise in the Consumer Price Index (CPI) of 0.5%. Percentage price changes are calculated as relative changes with respect to the numeraire (international prices in our model, which are constant).

When looking to the sectoral effects in Table 1, it is easy to see that there are only noteworthy impacts on the activity of hotels, restaurants and similar services with a reduction equal to -2.9%. As a result, there would be an important direct effect on employment, that drops in that sector by around -3.3%. There are also indirect effects that could not have been anticipated previously to this analysis and come from the important demand by hotels and restaurants to other sectors. Thus there are negative

but moderate impacts in the production of food and construction (-0.2%). The improvement in the activity of sectors like manufactures should be linked instead to the rebate of revenues from the tax reform to the households.

Despite the disparity between the main economic effects of a tourist tax on lodging and a moderate rise on VAT rates, the impact on non-residents is quite similar (see Table 2). The consumption of goods and services by non-resident falls by -1.4% approximately, whereas there is a drop in the expenditure made at hotel and restaurants by -4.7%. As a result, non-resident consumers reduce their total expenditure in Spain by -3.2% in response to the 2.0% increase in the prices of their consumption basket.

5.3. Effects of an ambitious reform on VAT rates

Finally, an ambitious increase in VAT applied to hotels, restaurants and similar services is simulated through the increase of tax rates by approximately 129% from the current reduced tax rate (7%) to the general tax rate (16%). In this case, the results show without any doubt that this reform will have significant effects on the economy and also on tourism. This is obviously intuitive, but it illustrates the effects of a homogeneous indirect tax treatment of tourism activities.

In this sense, the Spanish GDP will drop -0.48% at market prices and thus there is a progressive increase in the cost of this reform with respect to the moderate rise in VAT rates as a 33% increase in VAT rates doubles the costs. This information should be taken into account by policy makers and tourism managers to prevent disproportionate tax increases on that sector, although the effects on employment and capital or labor income are comparable to those obtained from the moderate reform.

The sectoral effects of both VAT reforms are alike in qualitative terms as it is shown in Table 1. Moreover, the CPI experiences a notable increase that is caused mainly by

a rise on the prices of services provided by hotels and restaurants. The outcome of this reform is thereby a substantial negative impact on non-resident tourism. The consumption of goods and services by non-resident falls significantly, especially in the case of expenses in hotels and restaurants.

5.4. Policy implications

To summarize, the tourist tax on lodging considered in this paper has limited effects on tourism from abroad and on the economy as a whole, except for hotel and restaurant services. Yet a similar and more modest initiative, the Balearic *ecotasa*, raised a strong opposition among the tourism local sector and foreign tour operators. That circumstance originated a significant policy constraint as tour operators could react by moving their business to other Mediterranean countries. Indeed, perhaps that is one of the reasons why the *ecotasa* was removed after only two years of application.

At the same time it can not be denied that reduced VAT rates on hotels and restaurants, where tourists have an important contribution to their activity, represent an implicit subsidy to these sectors in Spain. This contrasts with the desire expressed by different governments to increase tax revenues from these sectors and it also raises doubts on the neutrality and efficiency of indirect taxation. In fact, from an economic point of view, it is more sensible to raise VAT rates on hotels and restaurants to grant a similar tax treatment across the economy than to introduce specific taxes on tourists, which by themselves could affect the efficiency, neutrality and justice of the tax system.

Interestingly, a moderate increase in VAT tax rates on hotels and restaurants from 7% to 12% will lead to the same effects on tourist expenditures than the specific tax on lodging. The effects on the economy as a whole will be very similar too, although the VAT change will be more inflationary because of the change in consumer prices for hotels and restaurants. The subsequent reduction in economic activity is also

understandable in view of the larger group of taxpayers (not only non-residents) but, as indicated above, the wider tax scope is the guarantee for more efficiency and neutrality.

Finally, an ambitious increase in VAT rates on hotels and restaurants from 7% to 16% (the general tax rate) will create important costs for the economy that could make that reform politically infeasible. It will considerably raise the price index for non-residents who will consequently reduce their expenditure which, together with the internal induced effects, will affect hotels and restaurants to a large extent. In fact, costs in terms of GDP and inflation will be almost double with respect to the moderate increase in VAT rates.

After showing the economic and environmental reasons that justify specific taxes on tourism activities, the main message from this study to policy makers and tourism managers is that their effects are not significant for the economy in general and for tourism activities in particular (at least when the economy is not highly dependent of these sectors). However, they may introduce important distortions in the economy and bad practices such as black markets to avoid the tax. Furthermore, they are usually seen as unfair and against this sector, thus raising important opposition among managers and tour operators.

A tax reform that raises VAT on these activities to the standard rate could be better understood in the first place. Moreover, a tax reform like that will be also fairer by reducing the preferential tax treatment to specific sectors in the economy and therefore more neutral from an economic point of view, thus helping to improve the efficiency by eliminating distortions in the behavior of agents. In sum, we feel that there are clear advantages from the use of this policy approach in the taxation of tourism.

6. Conclusions

In this paper we have referred to the foundations of tourism taxation, as well as to the design and results of the hypothetical introduction of two tourism taxes in Spain. At least three reasons for taxing tourism were mentioned: it obtains public receipts in an efficient way (in terms of tax reform), it covers the conventional costs that arise because of tourists, and it can correct the negative external (mainly environmental) effects caused by tourism. There are different alternatives to tax tourist activities in order to achieve these objectives. The most common way is through conventional general taxation, although specific taxation is also possible normally in the form of a tax on lodging.

After briefly analyzing the situation of tourism taxation in Spain, mainly through a brief description of the now-repealed Balearic *ecotasa*, the effects of two hypothetical taxes with effects on tourism-related sectors were simulated with a AGEM for the Spanish economy: a lodging tax equal to 10% of the room rate and a rise in VAT rates on hotels, restaurants and similar services. It should be noted that the VAT rise affects all consumers in the economy, whereas the specific tax on lodging only affects to non-resident consumers directly. The results show that both the tax on lodging and a moderate VAT rise (from 7% to 12%) have similar effects, with minor changes in all sectors except hotels and restaurants. Finally, the economic effects of a VAT rise to 16% are much greater, so its implementation is likely to be unfeasible.

From a political economy point of view, it was suggested that specific taxes introduce important distortions in the economy and bad practices such as informal markets to avoid the tax. Furthermore they are usually seen as unfair towards the sector and generate strong opposition among tourism managers and tour operators. However, a tax reform that raises VAT rates on tourism activities to the average or near it could be better understood and improves the efficiency, neutrality and justice of the tax system. Nevertheless, policy makers should still be cautious: radical and sudden tax

reforms could be negative for the tourism sector and for those economies highly dependent on them.

Recapitulating, this paper should be taken as one of the first attempts within an applied general equilibrium framework to evaluate the effects of tourism taxation in a developed economy where tourism is relevant. There remain some relevant limitations, particularly the low degree of disaggregation of tourism activities in our model. It would be also desirable to disaggregate other sectors closely linked to tourist activities, such as transport services. Although these and other aspects should be addressed in future research, we believe that this article has provided some interesting policy insights into the use of taxes on tourism.

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Appendix: A more technical description of the AGEM

There are 17 price-takers productive sectors (and commodities) that minimize cost subject to constant returns to scale (therefore, null benefits at the equilibrium). The production function is a succession of nested constant elasticity of substitution (CES) functions as illustrated in Figure A1. As usual in AGEMs, total production in sector i is a combination through a Leontief function of intermediate inputs and a composite good made up by capital, labor and different energies.

We follow the Armington approach to model international trade of goods. Imported products are imperfect substitutes of national production. Therefore the total supply of goods and services in the economy is a combination of production from different origins by means of a CES function. Maximization of benefits by each sector, determined via a constant elasticity of transformation (CET) function, allocates the supply of goods and services between the export market and domestic consumption. Since the Spanish economy is small and most commodity trade is made with EMU countries, there is not an exchange rate (it is fixed) and all agents face exogenous world prices[5].

Capital supply is inelastic (exogenously distributed between institutions), perfectly mobile between sectors, but immobile internationally. The model assumes a competitive labor market and therefore an economy without involuntary unemployment. The labor supply provided by households to maximize utility is also perfectly mobile between sectors but immobile internationally.

The public sector collects direct taxes (income taxes from households, and wage taxes from households and sectors) and indirect taxes (from production and consumption). Endowment of capital for the government (K_G), transfers with other institutions (TR_G) and public deficit (DP) are exogenous variables. The consumption of goods and services

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[5] We assume that the policy simulated has no significant impact on the euro exchange rate due to the relatively small impact on the Spanish economy, and also to the fact that Spain's major business partners are countries which belong to the European Monetary Union (they account for respectively 73% and 64% of Spanish exports and imports in 2004).

(D_{iG}) by the government is determined by a Cobb-Douglas function, where PD_i stands for domestic prices. Therefore, total public expenditure, capital income (where r is the price for capital services) and tax revenues (*REV*) have to be balanced in order to satisfy the budget restriction,

$$\overline{DP} = r \cdot \overline{K}_G + \overline{TR}_G + REV - \sum_{i=1}^{17} PD_i \cdot D_{Gi}$$ (1)

The representative household has a fixed endowment of time which allocates between leisure (*LS*) and labor supply. They maximize utility (*W*) which is a function of leisure and a composite good (*UA*) made up by goods and savings, subject to the budget constraint[6].

$$W = \left(s_{UB} LS^{\frac{\sigma^{UB}-1}{\sigma^{UB}}} + \left(1 - s_{UB}\right) UA^{\frac{\sigma^{UB}-1}{\sigma^{UB}}} \right)^{\frac{\sigma^{UB}}{\sigma^{UB}-1}}$$ (2)

It is assumed that consumers have a constant marginal propensity to save which is a function of disposable income (Y_H). The later is equal to the sum of capital income, plus labor income (*w* is the nominal wage and SC_H stands for social contributions or labor taxes), plus transfers (*TR*), minus income taxes (T_H is the tax rate). Consumption of goods and services is defined by a nested CES functions as shown in Figure A2, with special attention being paid to the consumption of energy goods. An important contribution of the AGEM is the distinction between energy for the house, energy for private transport and other products.

$$Y_H = \left(1 - T_H\right)\left[r \cdot \overline{K}_H + w\left(1 - SC_H\right) \cdot \left(\overline{TIME} - LS\right) + \overline{TR}_H \right]$$ (3)

The AGEM represents a structural model based on the Walrasian concept of equilibrium. Therefore for each simulated policy the model must found a set of prices and quantities in order to clear up all markets (capital[7], labor and commodities). Total

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[6] σ^{UB} is the elasticity of substitution and S_{UB} is the share parameter for leisure on welfare.
[7] There is no quantity adjustments in total supply of capital in the economy because the capital endowment between institutions is an exogenous variable. There are only changes in the utilization of

savings (*SAVINGS*) in the economy is defined endogenously and equal to the sum of savings made by each one of the institutions. The macroeconomic equilibrium of the model is determined by the exogenous financing capacity/need of the economy with the foreign sector (*CAPNEC*). That is the difference between national savings, public deficit and national investment. The latter is an aggregated good by means of a Leontief function regarding the different commodities used in gross capital formation, *INV_i*,

$$SAVINGS + \overline{DP} - \sum_{i=1}^{17} PD_i \cdot INV_i = \overline{CAPNEC} \tag{4}$$

International prices *PXM_i*, transfers between the foreign sector and other institutions are exogenous variables. Therefore exports (*EXP_i*), imports (*IMP_i*) and the consumption of goods and services in Spain by foreigners (*D_{iRM}*)[8] have to be balanced in order to satisfy the restriction faced by the foreign sector,

$$\sum_{i=1}^{17} \overline{PXM}_i \cdot EXP_i + \overline{TR}_{RM} + CNR - \sum_{i=1}^{17} \overline{PXM}_i \cdot IMP_i = \overline{CAPNEC} \qquad \text{where} \qquad CNR = \sum_{i=1}^{17} PD_i \cdot D_{iRM} \tag{5}$$

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capital between sectors. The equilibrium condition is attained through changes in the price of capital services (*r*).

[8] The elasticity of substitution between different goods is unitarian (a Cobb-Douglas function), whereas the elasticity of total expenditure by non residents in Spain was calibrated to be -1.73 following estimations by Lozano, Morales and Navarro (2000) for Andalusia, one of the most important Spanish tourist regions.

Figure A1. Chained production technology structure
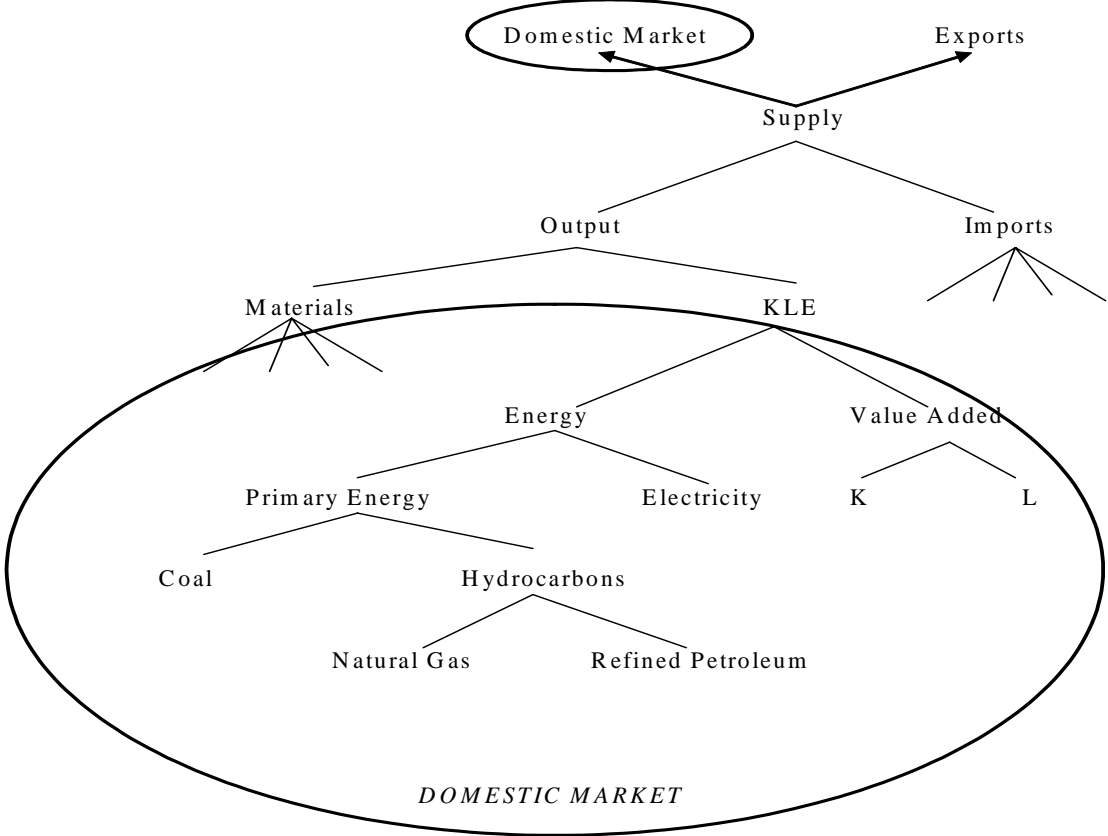
Figure A2. Chained household consumption function structure
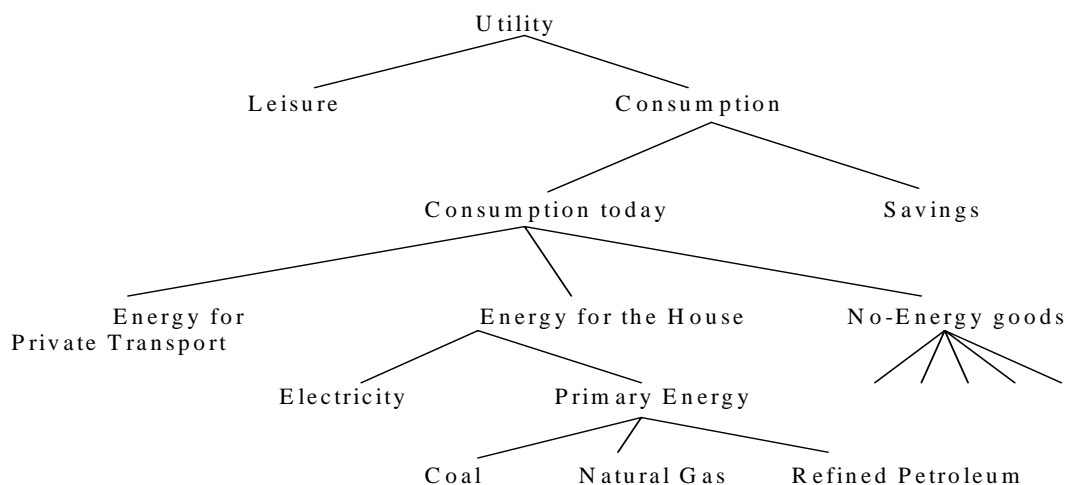
Table A1. Sectors in the NAM-95 and correspondence with SIOT-1995

Sectors NAM-95	Description	SIOT 1995 Code
AGRICULTURE	Agriculture, livestock and game, silviculture, fishing and aquiculture	SIOT 01, 02, 03
COAL	Extraction and agglomeration of anthracite, coal, lignite and peat	SIOT 04
OIL	Extraction of crude oil and natural gas. Extraction of uranium and thorium minerals	SIOT 05
MNER	Extraction of metallic, non-metallic nor energetic minerals	SIOT 06, 07
REFINED OIL	Coke, refined oil products and treatment of nuclear fuels	SIOT 08
ELECTRICITY	Electricity	SIOT 09
NATURAL GAS	Natural gas	SIOT 10
FOOD	Food and drink	SIOT 12-15
MANUFACTURES	Other manufacturing industries	SIOT 11, 16-20, 31-38
CHEMICAL	Chemical industry	SIOT 21-24
MINERAL PROD.	Manufacturing of other non-metallic minerals, recycling	SIOT 25-28, 39
METAL PROD.	Metallurgy, metallic products	SIOT 29, 30
CONSTRUCTION	Construction	SIOT 40
SERVICES 1	Telecommunications, financial services, real estate, rent, computing, RD, professional services, business associations.	SIOT 41-43, 50-58, 71
HOTEL & REST.	Hotel and restaurant trade	SIOT 44
TRANSPORT	Transport services	SIOT 45-49
SERVICES 2	Education, health, veterinary and social services, sanitation, leisure, culture, sports, public administrations	SIOT 59-70

Source: Own calculations. The Symmetric Input Output Table (SIOT) codes describe the different areas of activity published in INE (2002).

Table A2. Goods and services purchased by non residents in Spain in the Satellite Accounts of Tourism (SAT-96) and correspondence with the NAM-95

Sectors NAM-95	Sectors SAT-96
AGRICULTURE, COAL, OIL, MNER, REFINED OIL, ELECTRICITY, NATURAL GAS, FOOD, MANUFACTURES, CHEMICAL, MINERAL PROD., METAL PROD., CONSTR.	Other Goods
SERVICES 1	Housing rental
	Vehicle rental
HOTEL & RESTAURANTS	Hotel services
	Restaurant services
TRANSPORT	Passenger transport
	Travel agencies
	Other transport services
SERVICES 2	Cultural, sport and other leisure services

Source: Own calculations. Satellite Accounts of Tourism (SAT-96) are published in INE (2001).

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