

TOURISM TAXATION: AN APPLIED ANALYSIS FOR SPAIN

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ABSTRACT

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. Then the *praxis* of tourism taxation in Spain is described, with special mention being given to the now repealed Balearic 'ecotasa'. Finally, the effects of two fiscal modifications with revenue or corrective objectives are studied, making use of an applied general equilibrium model developed for the Spanish economy. We see that a 10% tax on lodging brings in significant revenue, 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 the economy as a whole.

Key words: taxation, tourism, environment,

JEL Classification: H22, L83, Q28

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1. Introduction

In recent decades tourism has become a primary economic activity of many countries, and Spain is no exception. 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 role that these taxes can be given.

In this paper we analyse the foundations underlying the taxation of tourism (section 2), and also examine its practical applications in Spain (section 3). We are particularly interested in studying the experience and effects of specific tourism taxes and the margins that exist for the introduction of environmental taxes in this area. To do so, we use an applied general equilibrium model (AGEM) for the Spanish economy which is described in section 4. Afterwards we simulate two hypothetical tax measures: the implementation of a tax on lodging and the rise of VAT rates applied on “tourism-related sectors (section 5).

2. Foundations of tourism taxation

The growing economic importance of the tourism sector, around 10% of the GDP and investment worldwide, 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 certain developed countries, and this figure can be as high as 50% in small tourist economies (WTO, 1998).

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

Having in mind this limitation, in the following paragraphs we analyse 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 and iii) internalisation 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 (growing or stable in recent decades in most countries), and in some cases for higher pressure than average. The reason is twofold: the low distortionary effects of this kind of taxation and the exportability of the fiscal burden.

A tourism tax distorts when demand is relatively elastic, since the price differential caused by the tax leads to a significant modification in behaviour. Traditionally it has been considered that many tourist destinations have no clear substitutes (for particular geographical or climatic reasons, distance, quality, etc.), which means that price elasticity is low and the alterations are not very relevant. This seems to be the situation in some countries, which nevertheless seem not to follow Ramsey's rule and thus do not tax with more intensity the least elastic demands (BIRD, 1992). Anyway, in recent years elasticities have increased in some tourist regions, due to the establishment of new countries in 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 there are some distortions in behaviour, 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 political decision-makers (GOOROOCHURN and SINCLAIR, 1992). According to the empirical evidence, both hypotheses are plausible in reality and the taxing of tourism thus becomes more attractive in terms of fiscal reform (see, for example, FUJI, KHALED and MAK, 1985). Nevertheless, this will only apply if tourists are non-resident in the jurisdiction that levies the tax. This means that exportability of central taxes only works if tourists are foreign, while for regional taxes it is enough if tourists come from outside the region.

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

Lastly, the external costs resulting from tourist activity are 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).

If a corrective tax leads to the inclusion of environmental and congestion costs in the final price of the tourism package, by way of a Pigouvian tax, economic efficiency will be restored. In addition, its effect on the quality of the tourism offer can be significant and this directly affects the tourist willingness to pay and, therefore, the magnitude of the added value of the sector. Furthermore, the tax can be used with a variable time profile, in order to avoid congestion peaks and de-seasonalise tourist activity. Nevertheless, we find again the impossibility of taxing tourism directly, so any corrective measure will also affect other taxpayers and economic sectors.

3. Tourism taxation in Spain

As we already stated, the tourism sector is faced with conventional or general taxation on economic activity and also a set of specific taxes that affect especially, but not exclusively, tourist activities. Within conventional taxation (general or specific sales taxes and income tax, for example) this sector can find itself subject to higher rates, although usually the high administrative costs of this option make it less attractive. Specific taxation generally takes the form of taxes on lodging, which are very common in the fiscal practices of developed and developing countries alike.

Spain is not excepted and general taxation on the Spanish tourism sector, sometimes below average due to the difficulty of distinguishing between tourists and non-tourists (see BLAKE, 2000), is now accompanied by a certain interest in the application of specific taxes on tourist activity. This is the case of two taxes implemented in the Balearic Islands: the recently announced tax on rented cars, and the now-repealed ecotasa, a tax that seemed to combine the three objectives mentioned above: revenue collection, coverage of costs and internalisation (GAGO and LABANDEIRA, 2001).

Though still a project, the tax on rented cars is defined as a double fee on renting cars: a fixed daily amount (between 4.5 and 5 euro depending on cubic capacity) and a

variable amount depending on the mileage (between 0.02 and 0.03 euro also depending on cubic capacity). Revenue will not be earmarked to environmental purposes and, though it will probably finance the health system, it will officially finance general expenditure¹. Anyway, it is difficult by now to carry out a proper analysis of the tax, though with the available information it seems that it will be a fairly strong tax, and therefore some effects can be expected.

Regarding the ecotasa, we can define it briefly as a regional tax assessing stays at hotel establishments, the taxpayer being the visitor who paid for the nights at the hotel and the substitute being the hotel company providing the service. It was a fixed amount per night for the length of the hotel stay, although it varied according to the type and category of the establishment. Also, the tax revenue was earmarked to a fund that was to finance actions aimed at improving tourist activity and preserving the environment (PALMER and RIERA, 2003).

The introduction of this tax was probably very much related to its high exportability and revenue collection capacity, as it increased the rather meagre regional tax basket resulting from Spanish legislation on the financing of regions, which favours central taxation. Also, the ecotasa could allow for a strategic action on the market in that its deterring 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 more questionable, although it could have had favourable environmental effects if it had managed to bring about a quantitative reduction and/or qualitative modification of tourism.

Despite the insistence of some commentators, earmarking the revenue obtained from a tax to environmental ends does not make it an environmental tax. In fact, the traditional definition of environmental tax requires that it have a clear and direct relationship with a specific environmental problem, in an attempt to evaluate with precision the environmental damage caused by the polluter, in order to punish the

¹ See "El País", 25th October and 3rd November 2005.

harmful behaviour that the tax hopes to modify (see section 2). This implies that its success or effectiveness should be reflected in a decrease in revenue collection over time, which acts against the objective of tax reform. Lastly, its revenue should not be earmarked for environmental expenditure because doing so conditions environmental policy programmes to the eventualities of the resource, meaning that there could be a loss in the budget significance that this policy deserves.

The Balearic ecotasa for tourists did not meet the conditions set forth above. This does not mean that it was not useful as a regulatory and revenue-collecting tourist tax, but it don't seem to be a useful instrument for reducing the environmental effects of tourism. For tackling with these problems in a more efficient way, stronger and/or more environmentally-oriented taxes are needed.

4. The methodology to simulate policy reforms in Spain

The tourism sector significantly contributes to the Spanish GDP, so taxing this activity could play an important role. As a result, it is required to use general equilibrium approaches to undertake any sensible analysis overcoming the limitations of partial equilibrium approaches. In this section we describe the methodology we have used to fulfil the objectives of this paper.

We use a static general equilibrium model for a small open economy with seventeen productive sectors. The production function is a succession of nested constant elasticity of substitution (CES) functions in which different energies and productive factors are combined (capital, K , and labour, L). Production in each sector is a combination of intermediate goods and the remaining productive factors (K , L , energy). Total supply of good i in the economy is a composite good, determined by a CES function, of national production and imports, which are considered imperfect substitutes. The final destination of the supply is exportation or the internal market, determined by a constant elasticity of transformation (CET) function.

Following the disaggregation of the Spanish national accounts, there are five institutional sectors in the economy: a representative household, the public sector, the external sector, companies and Non-Profit Institutions Serving Households (NPISH). Companies and NPISH receive capital income and make net transfers with other institutions. Companies pay an income tax and the NPISH consume goods and services, determined by a Cobb-Douglas function.

The public sector collects taxes on income, consumption, production, salaries and there is also a tourist tax initially null. It also obtains capital income, makes net transfers with other institutions and consumes goods and services, determined by a Cobb-Douglas function. The result is a public budget in deficit and financed with the savings of other institutions.

The representative household has a fixed amount of time that can devote to the consumption of leisure or to supply labour. He obtains income from both labour and capital, makes transfers with other institutions and pays various taxes. Her objective is to maximize its welfare according to its budgetary restrictions. The welfare function depends positively on the consumption of leisure, goods and services and it is the result of a succession of nested CES functions.

The model assumes a small open economy that exchanges goods and services with other economies and makes net transfers. The amount of goods and services consumed by the non-resident households in Spain (mainly tourism) is a composite good within a Cobb-Douglas function. Exports and imports allow for equilibrium in the balance of payments².

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

² There are no exchange rates in the model. We assume that the policy simulated has little impact on the exchange rate of the Euro, as Spain's major trading partners are countries belonging to the European monetary union.

difference between the national savings (defined endogenously by each of the institutions) and investments. The model assumes that markets of goods and factors are perfectly competitive, with no involuntary unemployment. The capital and labour supply is perfectly mobile among sectors but is immobile internationally, although the capital supply is inelastic.

The database used comes from a National Accounting Matrix (NAM-95) for the Spanish economy constructed upon the basis of the national accounting for the year 1995 and published in INE, the Spanish Institute of Statistics (2002a) and the satellite account of tourism in Spain published in INE (2001). To create the NAM-95 we have also used a SAM-95 at basic prices. Table A1 in the appendix reflects the fields of activity used for the purposes of this study and their correspondence with other statistical classifications.

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 benchmark³. 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 existing literature.

We calibrated a wage elasticity of labour supply of -0.4, similar to that estimated for Spain by LABEAGA and SANZ (2001). We performed a sensitivity analysis of the results obtained with the model, increasing and decreasing that value by 50%. The analysis leads us to conclude that the results obtained by the AGEM were robust with regard to significant changes in the elasticity of the labour supply. We also calibrated a price elasticity of the total expenditure made by non-resident consumers in Spain of

³ The general equilibrium model was programmed with GAMS/MPSGE, and the calibration was implemented following the method proposed in RUTHERFORD (1999), with the use of the solver-algorithm PATH.

-1.73, in accordance with the estimates obtained for Andalusia and presented in LOZANO, MORALES and NAVARRO (2000).

5. Simulating the effects of certain tourist taxes in Spain

Given the importance of the Spanish tourism sector and the role that could be played by the taxation of this activity, in this section we look into the effects of two taxes with effects on tourism. As we mentioned before, we cannot strictly talk about tourist taxes, but we can define tax reforms that *a priori* affect especially the tourism activity. To do so we use an AGEM for the Spanish economy, analysing the economic and environmental effects of two tax policies, with the revenue obtained being fully refunded to the citizens by means of lump-sum transfers.

First we look at the implementation of an ad valorem tax on hotel occupancy which is considerably more potent than the Balearic ecotasa. This tax is paid by non-resident consumers (basically incoming tourist consumption), but unfortunately, the database used in this study does not disaggregate the expenditure on lodging and restaurants. As our purpose is to simulate a tax rate of 10% on the expenditure for lodging, the tax rate finally used is 3.5% of both groups of goods. For this, we have kept in mind that the lodging outlay made by incoming tourism in 1995 represents approximately 35% of the total outlay in both lodging and restaurants (INE 2001).

Secondly, we analyse the effects of a rise in VAT rates applied on the consumption on tourism-related sectors: hotels, restaurants, cafes, bars and similar services. On the one hand, we simulate a moderate increase from the actual reduced tax rate equal to 7% to a greater 12%. On the second hand, we simulate an ambitious reform raising VAT of these services to the general tax rate (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 labour income. Perhaps most noteworthy is its limited effect on the activity of the hotel and restaurant sector (*HOST*), which falls only slightly, by -0.80% (see Table 1). Despite this, the tourist tax is able to generate a tax yield for the government of +358.7 million Euro.

Table 2 shows that the most significant effects are felt by non-resident consumers. The consumption of hotel and restaurant services falls by -4.60% and the consumption of other goods and services also falls (-1.3% approximately). As a result, non-resident consumers reduce their total expenditure in Spain by -3.14%, 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 equal to +363.3 million Euro.

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

	Tax on lodging		VAT 12%		VAT 16%	
	Production	P_i	Production	P_i	Production	P_i
<i>AGRICULTURE</i>	---	---	+ 0.20	- 0.20	+ 0.30	- 0.30
<i>COAL</i>	+ 0.10	---	+ 0.10	- 0.10	+ 0.10	- 0.10
<i>OIL</i>	+ 0.40	---	+ 0.70	---	+ 1.30	---
<i>MNER</i>	+ 0.20	---	+ 0.10	- 0.10	+ 0.20	- 0.10
<i>REFINED OIL</i>	+ 0.10	---	+ 0.10	- 0.10	+ 0.20	- 0.10
<i>ELECTRICITY</i>	+ 0,10	---	---	- 0.20	+ 0.10	- 0.30
<i>NATURAL GAS</i>	---	---	---	- 0.10	- 0.10	- 0.20
<i>FOOD</i>	- 0.10	---	- 0.20	- 0.10	- 0.50	- 0.20
<i>MANUFACTURES</i>	+ 0.20	---	+ 0.40	- 0.10	+ 0.70	- 0.10
<i>CHEMICAL</i>	+ 0.20	---	+ 0.30	---	+ 0.60	- 0.10
<i>MINERAL PROD.</i>	+ 0,10	---	- 0.10	- 0.10	- 0.10	- 0.20
<i>METAL PROD.</i>	+ 0.20	---	+ 0.20	- 0.10	+ 0.40	- 0.10
<i>CONSTRUCTION</i>	---	---	- 0.20	- 0.10	- 0.30	- 0.10
<i>SERVICES 1</i>	+ 0.10	---	+ 0.20	- 0.10	+ 0.40	- 0.20
<i>HOTEL & REST.</i>	- 0.80	---	- 2.90	+ 3.50	- 5.70	+ 7.00
<i>TRANSPORT</i>	---	---	---	---	+ 0.10	---
<i>SERVICES 2</i>	+ 0.10	---	+ 0.20	---	+ 0.30	---
<i>CPI</i>		---		+ 0.50		+ 0.90

Source: the authors.

Note: The percentage change in prices is calculated as relative changes in market prices and the consumer price index CPI with regard to the numerarie in our model (international prices, which are constant).

5.2. Effects of a moderate raise in VAT rates

We simulate also a moderate increase in VAT rates applied to hotels, restaurants and similar services. We increase the tax rates by approximately 67%, from the actual reduced tax rate (7%) to 12%. The results show us that this reform will have a moderate effect on the economy. The real GDP at market prices will be reduced by only a -0.24%. As a consequence, there would be no significant effects on employment

that drops slightly by a -0.20%. However, changes on capital and labour income would be more important (- 0.50% and -0.80% respectively) but they are still restrained.

If we look to the sectoral effects in Table 1 we found that there are only noteworthy impacts on the activity of hotels, restaurants and similar services with a reduction equal to -2.90%. Table 1 shows us also what are the effects on prices (market prices). As we could expect, the effects on prices are not significant except for hotels and restaurants, which increase their prices by +3.50%. That rises the consumer prices index by a +0.50%.

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

	Original €	Tax on lodging		VAT 12%		VAT 16%	
		Final €	Variation %	Final €	Variation %	Final €	Variation %
<i>FOOD</i>	1,209	1,194	- 1.25	1,194	- 1.25	1,179	- 2.49
<i>MANUFACTURES</i>	1,562	1,542	- 1.30	1,541	- 1.34	1,522	- 2.57
<i>CHEMICAL</i>	368	363	- 1.26	363	- 1.26	358	- 2.57
<i>SERVICES 1</i>	1,416	1,398	- 1.27	1,398	- 1.27	1,381	- 2.50
<i>HOTEL & REST.</i>	10,754	10,259	- 4.60	10,247	- 4.71	9,781	- 9.05
<i>TRANSPORT</i>	2,915	2,878	- 1.27	2,875	- 1.35	2,837	- 2.67
<i>SERVICES 2</i>	956	944	- 1.27	942	- 1.39	930	- 2.72
<i>TOTAL</i>	<i>19,178</i>	<i>18,577</i>	<i>- 3.14</i>	<i>18,560</i>	<i>- 3.22</i>	<i>17,986</i>	<i>- 6.22</i>
<i>CPINR</i>			<i>+ 1.90</i>		<i>+ 2.00</i>		<i>+ 9.00</i>

Source: the authors.

Notes: CPINR is relative change in the consumer price index for non-resident consumers.

5.3. Effects of an ambitious reform on VAT rates

Finally, we simulate an ambitious increase in VAT rates applied to hotels, restaurants and similar services. We increased tax rates by approximately 129%, from the current reduced tax rate (7%) to the general tax rate (16%). In this case, the results show us

without any doubt that this reform will have significant effects on the economy in general and also on tourism.

The Spanish GDP will drop a -0.48% at market prices. It is interesting to find that there is a progressive increase in the cost of the tax reform with respect to the rise on VAT rates. A 32% increase in VAT rates from 12% to 16% produces a more than proportional increase of costs, which are doubled. However the effects on employment and capital or labour income are comparable to that obtained from the moderate reform.

The sectoral effects from the ambitious reform on VAT rates are however alike in qualitative terms as it is shown in Table 1. In general there are increases in all sectors of the economy, where the manufacturing and chemical sectors account for the more remarkable positive changes (+0.70% and +0.60%, respectively). Hotels and restaurants experience an important drop on their activity levels equal to -5.70%. Other sectors that account also for negative impacts are the production of food and beverages (-0.50%) and construction (-0.30%). These effects could not be anticipated previously to this analysis and it results from the important demand of hotels and restaurants to those sectors.

Table 1 shows us also the effects of the ambitious reform on consumer prices. The results on sectoral prices are also no significant except for hotels and restaurants. They account for an increase equal to +7.00% in the services they provide. As a consequence, the consumer price index experience a notable increase (+0.90%).

5.4. Policy implications

In this section we would like to highlight the policy implications from results presented previously. First, the tourist tax on lodging that we have considered in this paper has limited effects on tourism from abroad and undersized effects on the

economy as a whole, except for hotel and restaurant services. A similar initiative, the Balearic *Ecotasa* which is a tax on lodging for all consumers, was introduced some years ago in the Balearic Islands. The policy raised a strong opposition between the tourism sector and mainly tour operators from abroad. The lobbying activity of tourism sector represents indeed an important policy constraint as long as tour operators could react by moving their business to other Mediterranean countries. Perhaps that is one of the reasons why the Balearic *Ecotasa* was removed after two years of experience.

The reduced VAT rates on hotels and restaurants (7%), where tourists have an important contribution, represent an implicit subsidy to these sectors. That would be an incongruity with a tourist tax on lodging. Interestingly, a moderate increase in VAT rates on hotels and restaurants from 7% to 12% will introduce the same effects on tourist expenditures as the specific tax on tourism. The effects for the economy as a whole will be very similar in general. However, if we compare the specific tax with the raise in VAT rates we found that the last one will be inflationary because of the change on consumer prices for hotels and restaurants, reducing their activity levels by a significant amount. But still it seems a more reasonable measure from an efficiency point of view since rising VAT rates on hotels and restaurants affect all consumers.

Finally, an ambitious increase in VAT rates on hotels and restaurants from 7% to 16% will create important costs for the economy which would make that reform politically unfeasible. On the one hand, it will raise the price index for non-residents by a +9%. As a result, tourists will reduce their expenditure by a -6.22%. The effects on hotels and restaurants will be more worrying. For the economy as a whole, costs in terms of GDP and inflation will be almost doubled than the moderate increase in VAT rates.

6. Conclusions

In this article we have referred to the foundations of tourism taxation, as well as to the design and results of its real or hypothetical introduction in the case of Spain. In the first place, we showed at least three reasons for taxing tourism: it obtains public

resources in an efficient way (in terms of fiscal reform), it covers the conventional costs that arise because of tourists and it corrects the negative external effects caused by tourism.

There are different ways to tax tourist activities in order to achieve these objectives. The most common way is through conventional taxation, although it is possible to focus exclusively to the tourism sector in those cases in which the magnitude of the costs of administration allows it (higher tax rates applied to certain consumptions, for example). A second alternative would be through specific taxation, which normally takes the form of a tax on lodging.

After briefly analysing the situation of tourism taxation in Spain, with an emphasis on the characteristics and assessment of the now-repealed Balearic *Ecotasa*, we performed a simulation of the effects of two hypothetical taxes, with effects on tourism-related sectors: a lodging tax equal to 10% of the room rate and a rise of VAT rates on hotels, restaurants and similar services. To do so we used an applied general equilibrium model for the Spanish economy in 1995.

The main results of this simulation show that both the tax on lodging and a moderate VAT rise (from 7% to 12%) have similar effects: restrained decrease of all sectors except hotels and restaurants. It should be pointed out that the VAT rise affect all consumers in the economy whereas the specific tax on lodging only affects directly to non-resident consumers. Finally, effects of a VAT rise to 16% are much greater, so its implementation will probably be unfeasible.

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Appendix

Table A1. Sectors in the NAM-95 and correspondence with SIOT-1995

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

Source: Drawn up by the authors for this study. The Symmetric Input Output Table (SIOT) codes represent the different areas of activity published in INE (2002a).