Air passenger duties as strategic tourism taxation

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ABSTRACT

There has been a recent debate on the rationale and economic impacts of air passenger duties (APDs) linked to puzzling empirical results on this topic. We argue that an approach from strategic tourism taxation can improve our understanding of these results. APD set by origin countries of tourists can be viewed as an instrument for extracting economic rents that would otherwise be retained by tourism destinations. A theoretical model of strategic taxation between an origin and two destinations is developed to illustrate this idea. We find that countries’ strategies may end up with winners and losers, or with all parties facing welfare losses. The game outcome depends on countries’ market shares of flows and the substitutability between tourism services provided by different destinations. The findings suggest that the economic impacts of APDs recently evaluated in the literature might be biased because of the omission of other countries’ potential tax reactions.

1. Introduction

Air passenger duties (APDs) established by several countries—such as Australia in 1978, United Kingdom in 1994, Germany in 2011, Austria in 2011, among others—have recently caught the attention of travel and tourism researchers (Forsyth & Dwyer, 2014a; Forsyth, Dwyer, Spurr, & Pham, 2014; Seetaram, Song, & Page, 2014), as deeper understanding is needed about their rationale and economic effects. APD can be generally defined as a specific per passenger tax that applies to departures and may be progressive according to flight distance. The tax burden affects both home travellers to foreign destinations (outbound tourism flows) and foreign travellers coming to the home country (inbound tourism flows). This topic is economically and socially relevant, as APD impacts on the tourism activity and welfare of both the home country and flight-connected tourism destinations. Notably, for the...
first time, the OECD (2014) has published a report on Tourism Trends and Policy 2014 including details on tourism related taxes, such as APD, in a large sample of countries. In the future, the report will continue to meet the growing demand from governments and the tourism industry for data on worldwide tourism taxation.

While APD has been mainly justified as environmental taxation (Pearce & Pearce, 2000), empirical results reveal that it neither significantly discourages travel demand (Seetaram et al., 2014) nor reduces greenhouse gas emissions (Mayor & Tol, 2007, 2010). As an alternative, public revenue-raising seems to provide a more accurate rationale for such a policy (Forsyth & Dwyer, 2014b). In this context, a general equilibrium analysis of APD impacts is needed to avoid tax inefficiencies. Empirical studies have obtained either positive or negative economic impacts for different economies (PwC, 2013; Forsyth et al., 2014). Therefore, there seems to be a puzzle regarding the rationale and economic effects of APD.

In this paper, we argue that this puzzle can be clarified if APD is viewed as strategic taxation established by origin countries of tourists with the aim of extracting rents from tourism destination countries. Indeed, OECD countries with the highest APD rates present travel account deficits (Eurostat, 2013; Sorel, 2007; Australian Government, 2016) and hence can be predominantly considered as tourism origins. This fact implies that the burden of APD is mostly borne by residents in origin, who are also taxed by tourism destinations. Owing to their particular features—landscape, mild weather, cultural heritage, business city, etc.—, destinations usually enjoy export market power in tourism, so they have incentives to exploit it via imperfect competition and/or tourism taxation (Forsyth & Dwyer, 2002).

The presence of international tourism intermediaries—mainly tour operators (TOs)—based in origin countries is a crucial factor in the analysis of strategic taxation for rent extraction, as they allow origins to earn a share of economic rents generated in tourism transactions (Cavlek, 2006). These intermediaries operate in the inclusive tour market, facilitating tourists the acquisition of the tourism shopping basket. This is a sizeable market; as an example, around 60% of Europeans opt by package holidays in 2014 (European Commission, 2015). Moreover, concentration is a main feature of this market (Papatheodorou, 2006). Small and medium intermediaries coexist with big conglomerates emerged after successive mergers. Remarkably, the two main European groups account for more than 50% market share in major origin markets (Touristik & Business Travel, 2014).

Regarding tax policy, it must be highlighted that origin countries cannot directly levy taxes on tourism imports, as these imports are consumed in the destinations. However, taxing air transport, a complementary service produced domestically, seems to be a feasible option. Thus, tourism taxes are used by destinations to extract economic rents from tourists (Gooroochurn & Sinclair, 2005), while APD may be understood as an origin’s strategy for extracting a portion of those rents.

To illustrate these ideas, we develop a theoretical model of tourism strategic taxation between an origin and two tourism destinations. Origin and destinations are assumed to be pure outbound and inbound tourism countries (Strand, 2008), and thus domestic tourism is not considered. This simple framework is enough to characterise the interactions between origin and destinations, as well as constraints linked to competition among destinations. The model is based on the literature of international trade under imperfect competition with vertical specialisation (Ara & Ghosh, 2016), and particularly, on the literature on strategic taxation in trade of non-renewable resources (Bergstrom, 1982; Liski & Tahvonen, 2004; Rubio & Escrich, 2001; Strand, 2008). In the latter case, strategic taxation is used by import countries with the aim of rent extraction from resource-exporting countries. Nevertheless, these models do not capture three of the main features of tourism markets: complementarity between transport—usually supplied in origin—and destination tourism services, heterogeneity and partial substitutability of tourism services provided by different destinations and the relevant role played by tourism intermediaries. For brevity, hereinafter we will refer to tourism services provided at the destination as tourism services. This clarification is pertinent since, according to United Nations (2010), transport and intermediation are also tourism characteristic products.

Our model does capture these features. Tourism services produced by destinations and transport services provided by the origin are assumed to be perfect complements, and hence make up a bundle of consumption (Divisekera, 2002; Wachsmen, 2006; Alvarez-Albelo & Hernandez-Martín, 2012). Tourism firms in each destination produce differentiated services, so they enjoy market power (Forsyth & Dwyer, 2002). These firms market their services through an intermediary or TO that is based in origin. In this respect, it is worthwhile to highlight that tourism destination firms can market their services through intermediaries (e.g. online travel agencies, traditional travel agencies and TOs) or via direct selling (Lu, Yang, & Yukkel, 2015). Nonetheless, in holiday markets direct selling represents a small share of the market (Romero & Tejada, 2011). In our model, the TO purchases transport and tourism services, build tourism packages and sells them to tourists.

The transport sector is competitive. We make the realistic assumption that this sector is based in the origin. However, this assumption does not affect the results of the model. Thus, we are assuming that no economic rent can be extracted from transport, which is in line with the increasing competition in the air transport sector due to liberalisation and the emergence of low cost carriers (Hofer, Windle, & Dresner, 2008; Oum, Zhang, & Fu, 2010). By contrast, tourism firms in the destinations and the TO in the origin earn their respective portion of total economic rent generated in tourism transactions.

Under this setting, governments at both origin and destinations have incentives for introducing strategic taxation on transport and tourism services, respectively, for rent extraction. Here, strategic interaction is modelled as a non-cooperative game giving rise to a Nash equilibrium.

The rest of the paper is organised as follows. Section 2 reviews the related literature and places this study within it. Section 3 outlines the model. Section 4 derives prices, productions and welfare at given taxes. Section 5 solves the tax game between countries. Section 6 discusses the results. Finally, section 7 concludes.

### 2. An overview of related literature

The empirical literature has mainly focused on studying APD impacts in the United Kingdom, Australia, Germany and Austria, the countries with the highest APD values in the OECD (TTF, 2013). The United Kingdom, Australia and Germany are net outbound tourism countries, and hence can be predominantly considered as tourism origins. The much smaller Austrian economy constitutes the only exception (Eurostat, 2013; Sorel, 2007; Australian Government, 2016).

Since barriers to air transport are forbidden by international aviation agreements (Pearce & Pearce, 2000; Steppler, 2011), APD has been mainly justified as environmental taxation for fixing externals caused by the aviation sector (Greenair, 2010; Seetaram et al., 2014)—the Australian one, however, is aimed at financing border public agencies (TTF, 2012)—. In this respect, Pearce and
Pearce (2000) estimated an externality tax for Heathrow airport in the United Kingdom and found that current APD, and hence similar taxes in other countries, could be justified on this basis. However, empirical results cast doubt on its suitability as an environmental tax. Mayor and Tol (2007, 2010) obtained that APD barely contributes to reducing greenhouse gas emissions, while Seetaram et al. (2014) found fairly modest impacts on UK air travel demand. Therefore, if environmental concerns are the central issue, APD ought to be substituted by better crafted policy instruments (Seeley, 2014). More specifically, to target precisely the external cost of aviation, tax rates of the duty must vary by aircraft type, aircraft emissions and flight distance.

To the contrary, the UK and Australian governments have progressively increased APD tax rates, Germany and Austria have introduced APD in 2011, and other countries such as Sweden and Portugal (IATA, 2014) are planning to adopt it. However, the UK government reformed in 2014 the APD banding structure — coming into effect in April 2015 — by merging bands B, C and D (Government of the United Kingdom, 2015), which significantly reduced long-haul rates.

Some authors argue that air transport is undertaxed, which could justify generating public revenues by means of aviation duties (Forsyth & Dwyer, 2014a; Keen & Strand, 2007). Consequently, if public revenue-raising is a rationale for APD, then a welfare assessment is needed to avoid tax inefficiencies. In this respect, Forsyth and Dwyer (2014a) review the potential economic impacts related with both inbound and outbound flows. In the case of inbound tourism, there are benefits related to the tax exporting effect (Fujii, Khaled, & Mak, 1985); but there are also costs as fewer inbound tourists will reduce domestic tourism activity. Nonetheless, empirical findings show that the costs related to the reduction in domestic tourism activity are small when the economy is in full employment (Blake, 2009). Regarding outbound tourism, there is a benefit if taxation discourages travelling abroad and promotes domestic tourism — it should be noted that this argument entails protection of the domestic tourism sector, which could lead to an inefficient resource allocation. Yet, the authors highlight that outbound flows should not be taxed at higher rates than other goods and services, since it would be welfare impairing. All in all, they find probable that benefits from APD exceed costs.

Forsyth and Dwyer (2014a) also survey empirical studies on the economic impacts of APD. Among these studies, Berster et al. (2010) evaluated the impacts of German Air Travel Tax, and obtained reductions in production and employment and net tax revenues lower than planned. Oxford Economics (2011) found that UK APD is detrimental to the tourism sector in the UK since it discourages long-haul inbound travellers, who spend more and generate more economic activity than short-haul visitors. Oxford Economics (2012) obtained negative impacts of the Austrian Flight Charge on production and employment. For the Australian economy, IATA (2013) obtained GDP and employment increases from removing the Passenger Movement Charge. It is worth noting that only two of them use a comprehensive general equilibrium approach. Moreover, these two studies obtain opposite results. On the one hand, PwC (2013) obtained negative overall impacts in terms of GDP and employment in the United Kingdom. On the other, the analysis of Forsyth et al. (2014) for Australia found a negative effect on the tourism sector, but positive impacts on the whole economy. In the case of Australia, APD acts as a transfer from the domestic tourism sector to other sectors of the economy.

Forsyth and Dwyer (2014a) identify four main reasons for the opposite impacts delivered by these two studies. Firstly, the UK APD is much higher than the Australian Passenger Movement Charge. Secondly, the UK results focus on the impacts on GDP, while the Australian ones are also expressed in terms of gross national income and welfare, which allows the tax exporting effect to be captured. Thirdly, the UK study assumes unemployment, while full employment is assumed in the Australian one. Lastly, the UK study assumes significant productivity gains in the whole economy coming from the aviation sector, which are reduced because of the tax. This aspect is not considered in the Australian study.

Neither of these studies considers our approach of APD as tourism strategic taxation, ignoring potential tax reactions of foreign economies affected by APD changes. This omission may well have significant implications, leading to biased impact estimates and, even worse, to mistaken decisions. In fact, in our framework a negative impact does not constitute, per se, a reason for eliminating the tax, since removal could lead to tax rises by foreign economies, hence a worsening of economic impacts. In the context of strategic taxation, assessment of economic impacts should be performed at an international level, including all interconnected countries. Non-cooperative behaviour could even lead to overall welfare losses, only avoidable by means of international tax agreements. This is in line with the OECD’s (2014) request for a careful global evaluation of the tax impacts and international coordination of tourism tax policies.

It is worth noting that strategic tax reactions by origin (and destination) governments require a large amount of information on tourism destinations taxes and tourist flows. For instance, the UK Office for National Statistics (2014) reports 58.5 million visits abroad to over fifty detailed destination countries in 2013. However, the bulk of visits (42.9 million) are made within the European Union (EU) for which there is extensive tax information. In fact, several studies sponsored by the tourism industry have surveyed tourism taxes in the EU (HOTREC, 2008; Ernst & Young, 2013; Ranson, 2014). This type of report is also available for other countries as, for instance, the report on tourism taxes in the US cities (Global Business Travel Association, 2011). Moreover, APD banding structures according to destination distances help to better react to tax changes in main tourism destinations. In the UK case, APD Band A includes trips of 0–2000 miles from London, which covers EU tourism destinations and about 75% of UK’s outbound flows. Clearly, more accurate and systematic information on partner and/or competitor countries, facilitated by an international organisation such as the OECD, would contribute to better crafted reactions.

To our knowledge, the possibility that origin countries of tourists use transport taxes strategically for rent extraction has not been previously studied. Notwithstanding, some contributions on strategic tourism taxation in the field of Tourism Economics are worth mentioning. Forsyth and Dwyer (2002) stated that retaliation by origin countries is an unlikely response to tourism taxation by destinations, since countries trade with a multitude of partners. However, Divisekera (2002) argued that retaliation may occur in the case of inbound and outbound tourism flows between two countries, so tourists coming from the offender country would become the object of reprisals. Strategic tourism taxation has been also analysed in a context of two competing small island tourism destinations suffering from congestion externalities (Mohan, Nabin, & Sgro, 2007). None of these contributions, however, have considered APD as strategic tourism taxation.

Our work is closely related to the literature on trade policy under imperfect competition. In the context of industrial organisation literature, the paper by Ara and Ghosh (2016) studies trade policy with vertical specialisation and bargaining power of firms. They consider a home country that produces a final good with a set of homogeneous intermediate inputs, imported from a foreign
country. As in our paper, profits are split off according to the exogenous bargaining power of the parties, which affects trade policy. More specifically, they find that an increase of the home firms bargaining power increases home profits, but might also raise foreign profits. Indeed, the larger home’s firms bargaining power, the lower the import tariff. By contrast, our paper differs from theirs in that both foreign and home countries interact strategically through specific taxation over two complementary services, air transport and tourism services.

Strategic taxation interaction for rent extraction has been profusely analysed by the literature on international trade of non-renewable resources such as oil (Bergstrom, 1982; Liski & Tahvonen, 2004; Rubio & Escriche, 2001; Strand, 2008). This is not surprising since the economic rents to be captured arise from the ownership of a natural resource that is exported. As a reaction, import countries may introduce taxation not only for fixing externalities but also strategically, for rent extraction from resource-exporting countries. Given that the economic rents in tourism come from destinations’ resources (natural and cultural heritage, among others), the setting resembles the interaction that takes place between origin and destination countries in tourism.

However, there are specific features of tourism that are not captured by the exhaustible resource extraction models. First, while countries can tax imported oil, origin countries cannot directly tax tourism imports since tourism services are consumed in destination countries. The strategy of tourism origin countries consists then of taxing transport, a complementary service; this idea resembles that in Wijkander (1985) on the use of taxes/subsidies to related goods for fixing externalities. Second, oil can be considered a homogeneous resource, so producers have incentives for cartelising. By contrast, tourism destinations are prone to compete as they produce differentiated, partially substitutable services, with the degree of substitution relying on destination features (Song, Li, Witt, & Fei, 2010). And third, the presence of intermediaries in origin countries plays a significant role as marketers of tourism services, as they provide the needed coordination and information to final consumers (Calveras & Orfila, 2014; Cavlek, 2006). Remarkably, intermediaries based in origin allow outbound countries of tourists to capture a portion of economic rents from abroad. Therefore, our work contributes to the literature by explicitly modelling these three features.

Regarding this latter aspect, our framework is supported by an extensive literature on tourism value chain and tourism distribution (Lu et al., 2015; Pearce, 2008; Song, Liu, & Chen, 2013). In this line, Romero and Tejada (2011) show that, particularly in holiday destinations, a hotel signs a year in advance bilateral contracts with intermediaries under an uneven relationship, as the market power of intermediaries erodes the market power of intermediaries. As in our paper, pro-


3. The model

A simple static model is developed representing the exchange of tourism services between one origin or outbound country of tourists (denoted by the superscript $o$), and two tourism destinations or inbound countries of tourists (denoted by the superscript $d$ and the subscript $i = 1, 2$). Domestic tourism in either country is not considered.

In our model, the tourists in origin must buy transport services produced in the home country for travelling and consume tourism services produced in the destinations. Both types of services are perfect complements and hence form a bundle of consumption (Divisikera, 2002; Wachman, 2006; Alvarez-Albelo & Hernández-Martin, 2012). Based on actual behaviour of tourism distribution channels (Buhalis, 2000; Calveras & Orfila, 2014; Cavlek, 2006), we assume that tourism firms in the destinations market their services through an international intermediary or TO that is based in origin. More specifically, the TO buys transport services in origin and also tourism services to firms in the destinations, builds tourism packages and, finally, offer them to tourists. The existence of a single TO in the model captures the aforementioned tendency towards concentration in the industry (Klemm & Parkinson, 2001; Halkier, 2010; Touristik & Business Travel, 2014). By contrast, the transport sector is assumed to be competitive, which reflects the liberalisation of the air transport sector (Hofer et al., 2008; Oum et al., 2010).

In this context, governments in origin and destinations may set transport and tourism taxes, respectively, with the aim of gaining a higher share of economic rents generated in tourism transactions. Our partial equilibrium model is purposefully built to focus the analysis on how strategic taxation modifies rent distribution between countries. Other aspects, such as the possibility of using taxes to fix market failures, are left aside. These aspects will be further discussed in section 6.

Next we describe the model pieces in detail.

3.1. Tourism demand

Transport and tourism services are perfect complements in a one-to-one relationship. Air transport services are homogenous, while destinations produce differentiated tourism services. Thus, there is a tourism demand associated with each destination, $i, j = 1, 2$. For the sake of simplicity, we consider the symmetric linear demands in Rotemberg and Saloner (1990):

$$X_{ij} = A - BP_i - C(P_j - P_i), \quad i, j = 1, 2, \quad i \neq j, \quad A, B > 0, \quad 0 \leq C < \infty.$$  \hspace{1cm} (1)

where $X_{ij}$ denotes demanded quantity of tourism packages of destination $i$, and $P_i$ represents the package price. Since a tourism package includes a unit of transport and a unit of tourism services, $X_i$ also represents the demanded quantity of transport and tourism services. Additionally, the package price includes transport and tourism services prices. In the demand function, the parameter $C$ measures the extent to which services provided by different destinations are substitutes. Indeed, tourism services are independent
when \( C = 0 \), since the demands only depend on their own price. By contrast, \( C \in (0, \infty) \) implies that destinations produce differentiated but partially substitutable tourism services. The services become more substitutable as \( C \) increases, and would become perfect substitutes when \( C \) is infinity. As a result, a price difference causes demand shifts in favour of (against) the destination with the lower (higher) price, i.e. \( X_i > X_j (X_i < X_j) \) if \( P_i < P_j (P_i > P_j) \). Importantly, substitutability also entails a higher price elasticity of demand, which makes demand curves flatter as the value of \( C \) increases.

3.2. The transport sector

The transport sector is competitive and travelling to any destination is priced at \( c^o + \tau^o \), where \( c^o > 0 \) is marginal production cost and \( \tau^o \in R \) is a specific tax (subsidy) on transport established by the government of origin.

3.3. The distribution channel of tourism services

The distribution channel of tourism services is composed of tourism firms in destinations and the TO. For simplicity, we treat tourism firms in each destination as a representative monopoly. According to actual interactions of tourism firms and the intermediary showed by empirical tourism literature (Buhalis, 2000; Medina-Muñoz, Medina-Muñoz, & García-Falcón, 2003), the TO and each tourism firm negotiate on the sharing out of profits generated in tourism transactions. Here, we represent this interaction by assuming the existence of full coordination of the supply chain through a revenue sharing contract (Cachon & Larivière, 2005; Guo & He, 2012; Jeuland & Shugan, 1983). More specifically, we consider the simple formalization in Cachon and Larivière (2005) to model the contract between the TO and the tourism firms. Before the TO makes decisions on prices and quantities, the parties agree upon a revenue-sharing contract with two parameters: the TO’s (the firms’) share in revenues \( \phi (1 - \phi) \) and the price earned by tourism firms \( P_i \). The parties’ profits can be written as:

\[
\text{TO’s profits} \rightarrow I^o = \sum_i I_i^o = \sum_i \phi P_i X_i - \left( c^o + \tau^o + P_i^o \right) X_i ,
\]

\[
\text{Tourism firms’ profits} \rightarrow I_i^o = (1 - \phi) P_i X_i - \left( c^d + \tau_i^d - P_i^d \right) X_i ,
\]

where \( c^d > 0 \) is the marginal production cost of tourism firms and \( \tau_i^d \in R \) is a specific tourism tax (subsidy) established by the government of destination \( i \). Adding up the functions in (2), the supply chain’s total profits become equal to:

\[
\sum_i I_i = \sum_i (I_i^o + I_i^d) = \sum_i P_i X_i - \left( c^o + \tau^o + c^d + \tau_i^d \right) X_i .
\]

Moreover, under the contract \( P_i^d = \phi (c^o + \tau^o + c^d + \tau_i^d) - (c^o + \tau^o) \), with \( \phi \in (0, 1) \); the parties’ profits become equal to a proportion of total profits, \( I^o = \phi \sum_i I_i \) and \( I_i^d = (1 - \phi) I_i \); and the prices and quantities chosen by the TO, \( P_i \), and \( X_i \), yield the maximum joint profits of the supply chain. Therefore, the shares in revenues also become the share in profits of the parties. The sharing parameter \( \phi \) depends on the bargaining power of the parties, which in turn depends on many factors —such as hotel size and category, managers’ qualification, etc.— as shown by Buhalis (2000). Also, as a proxy for the bargaining power, the parties might have outside opportunity profits. Under these circumstances, accepting the contract would require earning those profits besides a share of the surplus generated by the coordination, which shortens the feasible range for \( \phi \) (Cachon & Larivière, 2005).

It is worth noting that our approach involves no competition among firms located in different destinations, since we are concerned with the intermediated segment. The absence of competition is supported by the empirical fact that each tourism firm signs a distinctive and private contract with the TO. This tight relationship between a tourism firm and the TO—usually long lasting—somewhat isolates the firm from the rest of the market, thus restraining competition within and among destinations. Not surprisingly, the TO ends up greatly influencing tourism firms’ capital investment, quality upgrading, environmental policy, and human resources policy (Buhalis, 2000; Sigala, 2008). Noticeably, inter-firm competition is relevant in the segment of direct selling, which represents a much smaller market share than intermediation.

3.4. The origin country

Welfare can be computed as the portion of total surplus in tourism markets that is retained by origin, which is equal to the sum of consumer surplus (CS), TO’s profits and public revenues (expenses) from the transport tax (subsidy):

\[
W^o = \sum_i CS_i + I^o + \phi \sum_i X_i .
\]

The transport tax is primarily aimed at extracting a higher portion of economic rents from tourism transactions. However, the government of origin is restricted by losses in consumer surplus arising from the policy. Indeed, taxes entail higher prices and lower productions, and hence a reduction in tourists’ welfare. Thus, in the model the government seeks to maximise welfare, i.e. \( W^o \).

3.5. The destination countries

According to the literature on international trade (Helpman & Krugman, 1989), a government that aims to maximise domestic welfare should implement policies to fully exploit export market power, thus maximising the economic rent extracted from abroad. Therefore, it makes sense for a destination with export market power to set tourism taxation for rent extraction. In this respect, the government in destination must select a value for \( \tau_i^d \) that maximises the economic rent from abroad, which includes tourism private profits and public revenues (expenses), so its objective function can be expressed as:

\[
W_i^d = I_i^d + \tau_i^d X_i .
\]

3.6. Timing of the game

Strategic interaction is modelled as a non-cooperative game between governments of origin and destinations, which gives rise to a Nash equilibrium (Gardner, 2003). The timing of the game involves three stages. In the first stage, the governments of origin and destinations announce transport and tourism taxes, respectively. In the second stage, the TO and tourism firms in the destinations negotiate the share out of profits. The TO decides package prices and productions in the third stage. The model is solved by
backward induction.

4. Prices, productions and welfare at given tax values

This section solves for equilibrium prices and productions and computes welfare levels at given tax values. The equilibrium in the tourism markets yields prices and productions:

\[ P_i = \frac{1}{B} \left( X - B \left( \frac{\tau^o + \tau^d_i}{2} \right) \right) + \frac{c^o + c^d + \tau^o + \tau^d_i}{2}, \]  

(6)

\[ X_i = \frac{X - B \left( \frac{\tau^o + \tau^d_i}{2} \right)}{C} \left( \frac{\tau^d - \tau^d_i}{2} \right) \]

(7)

where \( X = (A - B(c^o + c^d))/2 \) is production in a zero-tax equilibrium, which is independent of the value of \( C \). The price in destination \( i \) depends positively on \( \tau^o \) and \( \tau^d_i \). By contrast, production in (7) depends on the assumption of substitutability. Under \( C = 0 \) a destination's production is negatively affected by \( \tau^o \) and \( \tau^d_i \), while it is positively related to \( \tau^d_j \) when \( C > 0 \). Indeed, the condition \( \tau^d_j > \tau^d_i \) causes a demand shift in favour of (against) destination \( j \) (i.e. \( X_i < X_j \)), and vice versa.

Taking into account (6) and (7), welfare of origin and destination \( i \) become equal to:

\[
W^o = \frac{1}{2(B + C)} \sum_{j \neq i} \left( \frac{X - B \left( \frac{\tau^o + \tau^d_j}{2} \right)}{2} \right)^2 + \frac{\varphi}{B} \sum_{j \neq i} \left( \frac{X - B \left( \frac{\tau^o + \tau^d_j}{2} \right)}{2} \right)^2 - \frac{C}{2} \left( \frac{\tau^d - \tau^d_i}{2} \right) - \frac{C}{2} \left( \frac{\tau^d - \tau^d_j}{2} \right) \left( \frac{X - B \left( \frac{\tau^o + \tau^d_j}{2} \right)}{2} \right) + \frac{\tau^o}{2} \sum_{j \neq 1} \left( \frac{X - B \left( \frac{\tau^o + \tau^d_j}{2} \right)}{2} \right) + \frac{\tau^o}{2} \left( \frac{X - B \left( \frac{\tau^o + \tau^d_i}{2} \right)}{2} \right)
\]

Consumer surplus (CS)

\[
W^d_j = \frac{1 - \varphi}{B} \left( \frac{X - B \left( \frac{\tau^o + \tau^d_i}{2} \right)}{2} \right)^2 - \frac{C}{2} \left( \frac{\tau^d - \tau^d_i}{2} \right) \left( \frac{X - B \left( \frac{\tau^o + \tau^d_i}{2} \right)}{2} \right) + \frac{\tau^i}{2} \left( \frac{X - B \left( \frac{\tau^o + \tau^d_i}{2} \right)}{2} \right) - \frac{C}{2} \left( \frac{\tau^d - \tau^d_i}{2} \right) \left( \frac{X - B \left( \frac{\tau^o + \tau^d_i}{2} \right)}{2} \right)
\]

Private profits (PP)

A shown by equations (8) and (9), origin and each destination earn the proportion \( \varphi \) and \( 1 - \varphi \) of private profits. From now on, we will refer to \( \tau^d \) as market share-out of profits. It is also worth noting that a demand shift caused by \( \tau^d_i > \tau^d_j \) leads to \( \Pi^d_i < \Pi^d_j \) and vice versa.

This simple specification implies that interactions among private agents lead to a share-out of total surplus generated in tourism markets. The origin country retains the consumer surplus and a portion of private profits, while destinations earn the remaining profits. Under these circumstances, governments may have incentives for setting strategic taxation with the aim of changing the market share-out of total surplus in favour of the domestic economy. However, in doing so, they modify market equilibrium, which results in a reduction of the total surplus to be distributed. Therefore, as we are going to show in the next section, not all countries can be better off from strategic taxation.

5. Strategic interaction and the Nash equilibrium

Each government chooses the tax value that maximises domestic welfare, taking other players’ actions as given. The first order conditions (FOCs) imply that governments select the tax value at which marginal gains and losses of welfare exactly compensate
each other:

\[
\frac{\partial W^o}{\partial \tau^o} = \frac{B}{2(B + C)} \sum (X - \frac{B}{2} (\tau^o + \tau^d_i)) - \phi \sum (X - \frac{B}{2} (\tau^o + \tau^d_i)) + \frac{B}{2} \frac{1 - \phi}{B} \left( X - \frac{B}{2} (\tau^o + \tau^d_i) - \frac{B}{2} \left( \tau^d_i + 2 \tau^d_i \right) \right)
\]

\[
\frac{\partial W^d}{\partial \tau^d_i} = -\left( 1 - \phi \right) \left( X - \frac{B}{2} (\tau^o + \tau^d_i) \right) - \frac{1 - \phi}{B} \left( X - \frac{B}{2} (\tau^o + \tau^d_i) - \frac{B}{2} \left( \tau^d_i - \tau^d_i \right) \right) + \frac{B}{2} \left( \tau^o - \tau^d_i \right) \left( \tau^d_i - \tau^d_i \right) - \frac{B}{2} \left( \tau^d_i - \tau^d_i \right) \left( \tau^d_i - \tau^d_i \right)
\]

Loss of consumer surplus (LCS)  
Loss of private profits (LPP)

\[
\sum_i \left( X - \frac{B}{2} (\tau^o + \tau^d_i) \right) - B \tau^o = 0
\]

(CPR1)  
(CPR2)

Change in public revenues (CPR)

The second order condition (SOC) for the government's problem in origin is \( \frac{\partial^2 W^o}{\partial (\tau^o)^2} = B(B/(2(B+C)) + \phi - 2) < 0 \), while the SOC for the government's problem in a destination is \( \frac{\partial^2 W^d}{\partial (\tau^d)^2} = (B+C)((1-\phi)/2 - 1) < 0 \). Straightforward manipulations of FOCs yield the reaction functions or best response functions of origin and destinations:

\[
\tau^o = \frac{2 \left( \frac{X}{B} \right) (1 - \phi) - 1}{2 \left( \frac{X}{B} \right) (2 - \phi) - 1} \left( \frac{2X}{B} - \frac{\tau^d_i + 2 \tau^d_i}{2} \right), \quad (12)
\]

\[
\tau^d_i = \frac{2 + \frac{X}{B}}{2 \left( 1 + \frac{X}{B} \right) (1 + \phi)} \left( \frac{2X}{B} - \tau^o \right) + \frac{C}{2 \left( 1 + \frac{X}{B} \right) \tau^d_i}, \quad (13)
\]

respectively. Because of the assumption of symmetric destinations, the origin's best response depends on destinations' actions jointly. By contrast, a destination's best response only depends on actions taken by the origin when tourism services are independent (\( C = 0 \)), while it also relies on the tax set by the competitor when tourism services are partial substitutes (\( C > 0 \)). Thus, a destination only reacts to actions of competitors, namely those destinations producing substitutable tourism services, as long as their demands are interrelated. This is a remarkable aspect, since it implies that in real economies strategic taxation among destinations is not a round robin, but a game between competitors.

In the next subsections, we first study origin's and a destination's fiscal reactions, given other players' actions, giving rise to taxes/subsidies in the Nash equilibrium. Then, we analyse the end result of strategic interaction in terms of welfare compared with a situation with no government intervention.

### 5.1. Incentives for taxation

Solving the system of equations composed of (12) and (13) yields the tax values of origin and destinations in the Nash equilibrium:

\[
\tau^o = \frac{2 \left( \frac{X}{B} \right) (1 - \phi) - 1}{2 \left( \frac{X}{B} \right) (2 - \phi) - 1} \frac{2 \left( \frac{X}{B} \right) (1 - \phi) - 1}{2 \left( \frac{X}{B} \right) (2 - \phi) - 1} \frac{2 \left( \frac{X}{B} \right) (1 - \phi) - 1}{2 \left( \frac{X}{B} \right) (2 - \phi) - 1} \frac{2 \left( \frac{X}{B} \right) (1 - \phi) - 1}{2 \left( \frac{X}{B} \right) (2 - \phi) - 1} \frac{2 \left( \frac{X}{B} \right) (1 - \phi) - 1}{2 \left( \frac{X}{B} \right) (2 - \phi) - 1}
\]

\[
\tau^d_i = \frac{2 + \frac{X}{B}}{2 \left( 1 + \frac{X}{B} \right) (1 + \phi)} \left( \frac{2X}{B} - \tau^o \right) + \frac{C}{2 \left( 1 + \frac{X}{B} \right) \tau^d_i}.
\]

if \( \phi = \frac{1 + 2 \frac{X}{B}}{2 \left( 1 + \frac{X}{B} \right)} \equiv \phi^d_i \),

\[
\tau^d_i = \tau^d_i = \frac{2 + \frac{X}{B}}{2 \left( 1 + \frac{X}{B} \right) (1 + \phi)} \left( \frac{2X}{B} - \tau^o \right) + \frac{C}{2 \left( 1 + \frac{X}{B} \right) \tau^d_i}.
\]

if \( \phi = \frac{1 + 2 \frac{X}{B}}{2 \left( 1 + \frac{X}{B} \right)} \equiv \phi^d_i \),

\[
\tau^d_i = \tau^d_i = \frac{2 + \frac{X}{B}}{2 \left( 1 + \frac{X}{B} \right) (1 + \phi)} \left( \frac{2X}{B} - \tau^o \right) + \frac{C}{2 \left( 1 + \frac{X}{B} \right) \tau^d_i}.
\]

respectively, which reveal that incentives for taxation depend on the market share-out parameter and the degree of substitution of tourism services.

Prices and productions are obtained introducing the tax values
in (14) and (15) into equations (6) and (7). The Nash equilibrium or tax equilibrium (TE, denoted with the subscript T) delivers a higher price and a lower production than the zero-tax equilibrium (ZTE, indicated with a bar):

\[
\Pi^T = \frac{2}{C_18} + \frac{C_{18}}{C_18} + \frac{C_{19}^4}{C_19} X + \co + \cd > \Pi^Z.
\]

In the same vein as Ara and Ghosh (2016), \( t^o \) (\( t^d \)) is negatively (positively) related to \( \phi \). In other words, since taxation is aimed for rent extraction, the higher \( \phi \) the smaller (greater) the origin’s (a destination’s) incentives for taxation. Nonetheless, it is worth noting that in our tourism model the degree of substitution between services offered by different destinations greatly affects those incentives. These effects can be analysed using the FOCs of the government problem of origin and a destination in equations (10) and (11), respectively.

Indeed, in the case of independent tourism services (\( C = 0 \)), equation (10) entails compensation between marginal losses of consumer surplus (LCS), private profits (LPP) and public revenues due to the reduction in production (CPR2), and marginal gain of public revenues holding production constant (CPR1). When \( \phi = 1/2 \), losses LCS + LPP and the gain CPR1 exactly offset each other, so the best response is setting \( r^o = 0 \). When \( \phi < 1/2 (\phi > 1/2) \) the gain CPR1 exceeds (falls short) losses LCS + LPP, so taxing (subsidising) becomes the best response. Equation (11) entails compensation between marginal losses of private profits (LPP) and tax revenues due to the reduction in production (CPR2), and the marginal gain of tax revenues holding production constant (CPR1). The gain CPR1 exceeds the marginal losses LPP, so taxing is always a destination’s best response.

Therefore, a Nash equilibrium with positive taxes is reached under the condition \( \phi < 1/2 \). Under this value range, reaction functions of origin and the bulk of destinations in (12) and (13), respectively, are downward sloping. Thus, the players’ actions are strategic substitutes (Yalcin et al., 2013). Since transport and tourism services are complementary goods, tax (taxes) set by a player (set of players) raises package prices and reduces productions in equations (16) and (17), thus lessening the total surplus. The player setting the tax gets a higher share of total surplus. As the other player’s portion is reduced, its best response involves reducing taxes, provided that enlarging the total surplus is the only way of getting a greater share of it.

By contrast, when tourism services are partial substitutes (\( C > 0 \)), the origin and also the destinations might establish a tax, no tax or a subsidy. The results for the origin can be interpreted applying the previous reasoning. Thus, the government of origin may introduce a tax, no tax or a subsidy if \( \phi \) is lower than, equal to or higher than \( \phi^o \). Notably, the value of \( \phi^o \) which for no tax is the best response turns out to be higher than under \( C = 0 \), i.e. \( \phi^o > 1/2 \). Thus, higher substitutability widens the value range of \( \phi \) for which taxation becomes the best response. This is because substitutability between tourism services supplied by destinations makes demands more elastic, which results in smaller losses of consumer surplus.

Due to the existence of a competitor, the FOC of a destination in (11) now includes additional marginal losses of private profits and public revenues, and also a reduction in the marginal gain of public
revenues. As a result, taxation is no longer the only possible outcome. Indeed, setting \( \tau_1^d > \tau_2^d \), the marginal loss LPP and the marginal gain CPR1 exactly compensate for \( \pi^d \). In this case, interaction between destinations leads to zero taxes. When \( \phi > \phi^d_1 \) (\( \phi < \phi^d_1 \)) the marginal gain CPR1 exceeds (falls short) the marginal loss LPP, so destinations establish the same tax (subsidy). Moreover, incentives for taxation weaken as \( C \) raises since a higher degree of substitution makes demands more price elastic, which enlarges the losses LPP and CPR2 and lowers the gain CPR1.

A Nash equilibrium with positive taxes is reached provided that \( \pi^d < \phi < \phi^o \). Since tourism services supplied by destinations are partially substitutes, reaction functions of destinations at a given transport tax are upward sloping. This implies that the players’ actions are strategic complements (Yalcın et al., 2013). A tax established by one destination raises the competitor’s tourism demand. Thus, the competitor’s best response also consists of setting a tax and, eventually, both destinations reach a subgame equilibrium with taxes. The strategic interaction between origin and the bulk of destinations takes place as previously described.

In conclusion, a higher degree of substitution reinforces the origin’s incentives for taxation, since it faces smaller losses of consumer surplus. Conversely, a destination’s incentives are restrained by the presence of a competitor offering substitute services.

5.2. Welfare outcomes

The welfare outcomes from the game come from introducing taxes, prices and productions obtained in the previous subsection into the welfare functions in (8) and (9). As expected, these outcomes depend on the market share-out parameter and the degree of substitution. After computing the welfare levels in the TE, denoted as \( W^o_1 \) and \( W^o_2 \), and those levels in the ZTE, \( W^o \) and \( W^o_i \):

\[
W^o_1 \left( \phi, \frac{B}{C} \right) = \frac{4 \left( 1 + \frac{C}{B} \right) - 1 + 2 \left( 1 + \frac{C}{B} \right) \phi}{B \left( 1 + \frac{C}{B} \right)} \left( 2 \left( 1 + \frac{C}{B} \right) \frac{X}{1 + \frac{C}{B} - \frac{C}{B} \phi} \right)^2,
\]

\[
W^o_2 \left( \phi, \frac{C}{B} \right) = \frac{1 + 2 \left( 1 + \frac{C}{B} \right) \phi}{B \left( 1 + \frac{C}{B} \right)} \left( \frac{2 \left( 1 + \frac{C}{B} \right) X}{3 \left( 1 + \frac{C}{B} - \frac{C}{B} \phi \right)} \right)^2,
\]

\[
W^o_i \left( \phi, \frac{C}{B} \right) = \frac{1 + \phi}{B \left( 1 + \frac{C}{B} \right)} \left( \frac{2 \left( 1 + \frac{C}{B} \right) X}{3 \left( 1 + \frac{C}{B} - \frac{C}{B} \phi \right)} \right)^2,
\]

\[
W^o_i \left( \phi, \frac{C}{B} \right) = \frac{1 - \phi}{B} X^2,
\]

we define the functions \( F^o \left( \phi, \frac{C}{B} \right) \) and \( F^o_i \left( \phi, \frac{C}{B} \right) \) for origin and a destination, respectively, which allow us to compare the welfare outcomes from the game with those obtained in the ZTE:

\[
F^o \left( \phi, \frac{C}{B} \right) = W^o_1 \left( \phi, \frac{C}{B} \right) - W^o \left( \phi, \frac{C}{B} \right) > 0 \text{ if } \phi < \phi^o,
\]

\[
F^o \left( \phi, \frac{C}{B} \right) = W^o_1 \left( \phi, \frac{C}{B} \right) - W^o \left( \phi, \frac{C}{B} \right) < 0 \text{ if } \phi > \phi^o.
\]

\[
F^o_i \left( \phi, \frac{C}{B} \right) = W^o_i \left( \phi, \frac{C}{B} \right) - W^o_i \left( \phi, \frac{C}{B} \right) > 0 \text{ if } \phi > \phi^o_i,
\]

\[
F^o_i \left( \phi, \frac{C}{B} \right) = W^o_i \left( \phi, \frac{C}{B} \right) - W^o_i \left( \phi, \frac{C}{B} \right) < 0 \text{ if } \phi < \phi^o_i.
\]

Insomuch as \( F^o \left( 0, \frac{C}{B} \right) > 0 \) and \( F^o \left( 1, \frac{C}{B} \right) < 0 \), there is a threshold value \( \phi^o \) that yields equalisation between welfare levels in the TE and the ZTE. This is so because the welfare level associated with the TE decreases as \( \phi \) rises, provided governments at origin and destinations set a lower and a higher tax value, respectively. To the contrary, origin’s welfare in the ZTE is an increasing function of the market share-out of profits, because the higher \( \phi \) the more profits will be earned by the origin country. Thus, origin will be better (worse) off from strategic taxation whenever its share in private profits is lower (higher) than \( \phi^o \). Likewise, \( F^o_i \left( 0, \frac{C}{B} \right) < 0 \) and \( F^o_i \left( 1, \frac{C}{B} \right) > 0 \), so there exists a value \( \phi^o_i \) such that \( F^o_i \left( \phi^o_i, \frac{C}{B} \right) = 0 \). This result arises because a destination’s welfare in the ZTE and the TE is negatively and positively related to \( \phi \), respectively. Accordingly, a destination will benefit from strategic taxation whenever \( \phi > \phi^o_i \), while the opposite applies if \( \phi < \phi^o_i \).

Imposing \( F^o \left( \phi^o, \frac{C}{B} \right) = 0 \) and \( F^o_i \left( \phi^o_i, \frac{C}{B} \right) = 0 \), we can define the implicit functions \( \phi^o = F^o \left( \phi \frac{C}{B} \right) \) and \( \phi^o_i = F^o_i \left( \phi \frac{C}{B} \right) \), where \( B \) is set constant. The welfare outcomes of the game can be then analysed by looking at the representation of these functions depicted in panel (a) of Fig. 1.

The value range for \( \phi \) considered in the figure, from 0 to 10, is enough to evaluate the effects of the degree of substitution on welfare. Indeed, it is easy to check that \( \phi^o \) and \( \phi^o_i \) approach one as \( \phi \) goes to infinity. The panel (b) of the figure shows the regions where origin and destinations set taxes or subsidies in the Nash equilibrium, according to the analysis in the previous subsection.

The function \( \phi^o \) in panel (a) takes the value 0.12 when tourism services are independent, i.e. \( \phi = 0 \). As \( \phi \) rises the origin becomes more willing to tax, since more substitution involves smaller losses of consumer surplus. As a result, the range for \( \phi \) entails a welfare improvement for the origin widens as tourism services become more substitutable. In the case of destinations, independent tourism services yield a higher value \( \phi^o_i = 0.38 \) than for the origin, as a destination does not face losses of consumer surplus and hence has more incentives for taxation. The threshold value \( \phi^o_i \left( 1 - \phi^o_i \right) \) increases (decreases) monotonically as \( \phi \) rises, which curtails the range of \( \phi \) involving welfare gains for a destination. Clearly, origin’s incentives for taxation are being reinforced, while the benefit of setting taxes for a destination is now restricted by demand shifts due to substitutability.

Note that all parties lose in terms of welfare whenever \( \phi^o < \phi < \phi^o_i \), providing a rationale for reaching an agreement to remove taxation. Furthermore, a comparison of panels (a) and (b) reveals that the region of welfare losses lays within the area where all parties set taxes. Therefore, an equilibrium where both origin and destination set taxes can give rise to any welfare outcome: the origin (a destination) could be worse (better) off from strategic taxation, vice versa, or all parties could be worse off.

6. Discussion of results

We have just shown that APD allows an origin country to earn an increased share of economic rents generated in tourism transactions. Consequently, the duty emerges as an indirect instrument for taxing tourism imports. In our setting, origin and destination countries may interact strategically by levying transport and
tourism taxes, respectively, for rent extraction. The non-cooperative strategic game can never result in a win-win outcome. Two factors influence the game result. First, a country’s incentives for taxation are negatively related to its market share in total private profits. Second, substitutability among tourism services provided by different destinations reinforces the origin’s incentives for taxation, while weakening the destinations’ incentives for taxing.

In our model, we use symmetric linear demands to illustrate the core idea in the paper. Our analysis could certainly be generalized by considering asymmetric linear demands (Edirisinghe, Bichescu, & Shi, 2011; Tsay & Agrawal, 2000), and even nonlinear demands (Ara & Ghosh, 2016), which would give rise to a more complex tax interaction between origin and destinations. Moreover, we make the simplifying assumption of exogenous bargaining power. However, it could be argued that the negotiating power of the TO depends on the degree of substitution, as the TO determines in a great extent tourism flows among destinations. Therefore, our analysis of rent distribution between origin and destinations could be extended by endogenising the negotiating power, to make it depend on the degree of substitution besides other factors. This extension would require the construction of a richer model with heterogeneous firms in destinations, as the negotiating power greatly depends on firm-specific factors (Buhalis, 2000).

In addition, the model considers two destinations to analyse the role of substitutability between tourism services produced by different destinations. This simplification about competition between destinations is enough to illustrate the ideas in this paper. Since destinations usually have some close substitutes, the scenario with substitutability seems to better reflect interaction among destinations. Though, it should be noted that in real economies competition takes place among a large number of destinations with different levels of substitutability, which adds complexity to tax decision making.

Our results are in line with observed tax behaviour of tourism origins and destinations. In the model, transport and tourism services are perfect complements, and hence the players’ tax decisions are strategic substitutes. As a result, destinations react to a transport tax increase by reducing their tourism taxes, while the origin will raise the transport tax in response to reductions in tourism taxes. A Nash equilibrium with positive taxes is eventually reached. For instance, UK and Australian APD have progressively increased over time, and other European countries have recently introduced the duty or are planning to do so. By contrast, most destination countries operate a reduced VAT for tourism related services, while specific tourism taxes (mainly on accommodation) are primarily confined to the local level (OECD, 2014). For example, Ranson (2014) reports that, among the 31 European countries considered by Ernst and Young (2013), only 17 countries have tourist taxes, often levied in specific regions or cities. These taxes apply mainly on accommodation and range from €0.15 to €5. Notably, 23 out of 31 countries operate a reduced VAT for tourism related services.

Our model also has implications for international tax coordination. In real economies, we observe both APD in origin countries and tourism taxes in destinations, so it is likely that some countries are getting a benefit. If this is the case, the winners would never be willing to remove or reduce their taxes. What is more, neither would the losers do so. The underlying reason is that a country’s reaction entails its best response to other players’ actions. Therefore, even in the case of a negative impact, current taxation is the best the player economy can do.

Removing taxes intended for rent extraction makes sense when all parties become worse off. However, this would require a multilateral agreement to avoid strategic behaviours triggering a new escalation of reactions, since there are individual incentives for deviating. These agreements could be then restricted to particular areas because of the geographical segmentation of the global tourism market. Nonetheless, reaching such an agreement would encounter serious obstacles. The origin and, particularly, destinations may have room for applying new taxes or regulations not included in the agreement. As an excuse for deviating, countries might argue that taxes are aimed at fixing market failures and not for rent extraction. In practice, the countries involved are numerous and asymmetric, hindering a stable arrangement.

Thus, a more plausible alternative is the formation of partial coalitions among either origins or destinations (Itaya, Okamura, & Yamaguchi, 2014), and not necessarily to remove taxation but to react better to other countries’ taxes. For instance, some destination countries could be worse off from strategic taxation when acting non-cooperatively, while they might become better off when acting as a coalition. Owing to their potential impacts on travel flows and welfare, issues regarding tax coordination in tourism certainly constitute a relevant research line. This issue, and its serious implications on tourism competitiveness and welfare, has recently been highlighted by the OECD (2014).

Assessing the empirical relevance of our hypothesis is crucial for the analysis of the general equilibrium impacts of APD (Forsyth et al., 2014), since our results show that the omission of other countries’ strategic reactions could lead to biased estimates. The economic estimation of reaction functions (Devereux, Lockwood, and Redoano, 2008), and an approach from general equilibrium models such as that in Sørensen (2004) and Mendoza and Tesar (2005) could be useful in avoiding this bias. Despite its simplicity, our work could be a helpful starting point for building an empirically suitable model.

Finally, some additional factors that were left aside deserve to be discussed. We have purposely opted for building a simple model allowing a straightforward exploration of rent redistribution between origin and destination countries caused by strategic taxation. However, our hypothesis of strategic taxation does not imply that other potential foundations for APD should be discarded. Indeed, APD could also be justified as non-strategic public revenue-raising or as environmental taxation. Likewise, pure rent extraction is not the only foundation for tourism taxes set by destinations, as tourism activity is associated with a wide range of market failures, such as environmental and congestion externalities or over-exploitation of common resources (Briassoulis, 2002; Chang, Lu, & Hu, 2010; Pintassilgo & Silva, 2007), which could be fixed by taxation. Importantly, tourism tax revenues also finance public capital required by the tourism sector for tourism rejuvenation policies, destination promotion, etc. Whether strategically or not, origin APD reduces public rents at tourism destinations, which would certainly affect a destination’s capacity for taxation.

In line with Strand (2008), we model origin and destinations as pure outbound and inbound tourism countries. Domestic tourism activity in origin and hence APD effects on inbound tourism flows are absent. As shown by Forsyth et al. (2014), this aspect should not be minimised as tax changes could greatly impact on the domestic tourism sector and resource allocation in the whole economy.

Our model does not consider substitution between transport modes and between airports placed in border countries. A transport mode shift effect should not be neglected in countries such as Germany, where land or intermodal transport can be, to a certain extent, a substitute for air transport. In addition, passengers could be diverted to alternative airports in other countries. These transport mode substitution effects may reduce an origin’s incentives for setting APD. The Netherlands is a paradigmatic case in this respect, where the air passenger tax was introduced and removed within one year, 2008. The tax impact estimates for Schiphol Airport show that two million passengers were lost, and one million were transferred to foreign airports (Kim, 2011).
7. Conclusion

This paper has shown that strategic taxation for rent extraction can be a sound underlying reason for setting APD. This duty can be justified as strategic taxation established by origin countries of tourists for extracting economic rents that would otherwise be retained by tourism destinations. Strategic interaction between origins and destinations gives rise to tax reactions that may end up with winners and losers, or with all parties being worse off in terms of welfare. Since the process entails a fight for economic rent, the market share-out of profits is a key factor in explaining the game results. Indeed, the model shows that the lower its share in profits, the more likely a country will benefit from strategic taxation. The degree of substitutability between tourism services produced by different destinations also plays a significant role, as it strengthens an origin’s incentives for taxation while weakening destinations’ incentives.

This paper has put forward relevant aspects on the strategic interaction between tourism origins and destinations that, to our knowledge, have not previously been studied. To do so, we have developed a simple theoretical framework that captures particular features of tourism transactions. Owing to its implications for policy design, strategic tourism taxation needs to be further studied both theoretically and empirically. In this respect, our theoretical analysis could be extended in several directions, such as considering nonlinear and asymmetric tourism demands, endogenous negotiating power, direct selling, inbound and domestic tourism in countries setting APD, or general equilibrium implications, besides serving as a basis for empirically testing the hypothesis of APD as strategic taxation for rent extraction. Tax coordination also emerges as a relevant matter for future research.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.tourman.2016.12.002.

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